

STARSHIELD™
ZERO LENGTH SHIELD
TERMINATION BACKSHELLS

FOR RUGGED EMI/RFI APPLICATIONS

DECEMBER 2012

WHAT IS STARSHIELD™ “ZERO LENGTH SHIELD TERMINATION?”

For decades, bundles of individually shielded cables have been used to solve many electrical system design issues from cross-talk to wire-routing/management and maintenance. These individual shields were frequently “pigtailed” by pulling the center conductors through the outer shield, or by soldering drain-wires to the shield, then terminating these pigtails or drain wires via a terminal lug to the cable-clamp on the back of the connector.

Pigtails or drain wires, suffer from several shortcomings. First, they force shield current to flow in an asymmetrical manner yielding higher transfer impedances. Second, and perhaps more importantly, the pigtail or drain-wire itself creates a “loop in the shield” or “standing antenna” effect. Coupled with the exposed lengths of unshielded wires, this condition acts as a receptor and/or radiator of noise. EMC performance will drop to unacceptable levels at higher frequencies dependent on the length of the pigtail. Over the years, more elegant methods of terminating pigtails or drain-wires have been developed that effectively shorten these lengths, however the underlying issue still exists—particularly in higher-bandwidth and less noise-tolerant applications which demand ever-shorter pigtail lengths for acceptable performance.

The best connection is one in which the individual shields are extended up to and make solid 360° connections to the backshell leaving no length of unshielded wires exposed outside of the ground plane. Effectively, this reduces the length of the pigtails or drain-wires to zero, and eliminates the standing antenna. Said another way, Zero Length Shield Termination may be achieved via a 360° termination of signal group shields (the individual shields over the wires or twisted pairs in a bundle) to an encapsulating ground in which no pigtails or drain wires are necessary to terminate the shields to the connector body or backshell.

Glenair’s StarShield “Zero Length Shield Termination” backshell methodology excludes pigtails or drain-wires altogether by providing termination platforms referred to as “ferrules” which allow individual shields to be terminated by a 360° solder connection in one easy process. The ferrules in-turn lock into a “star” that provide another 360° termination to the encapsulating ground plane of the backshell body. By eliminating the issues associated with pigtails or drain-wires, this system not only offers the highest level of EMC performance, but is also one of the most reliable, repairable individual shield termination methods on the market today.



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StarShield™ Shield Termination Backshells

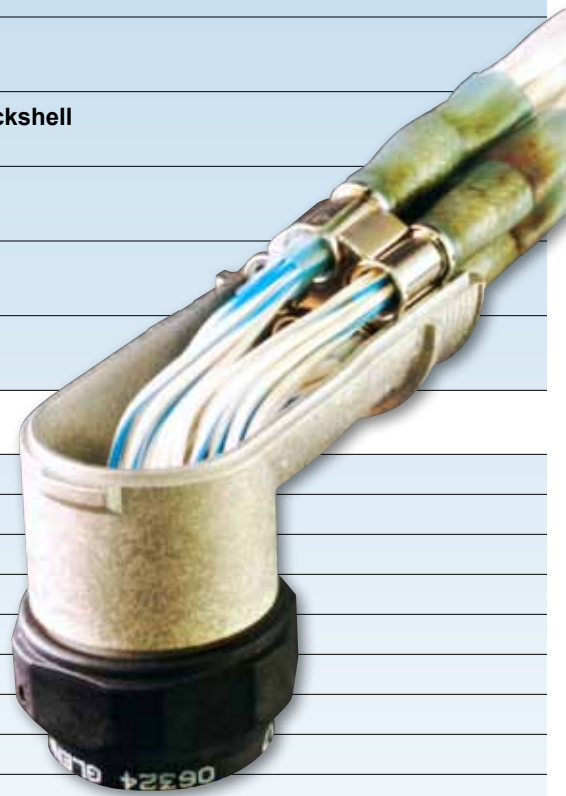
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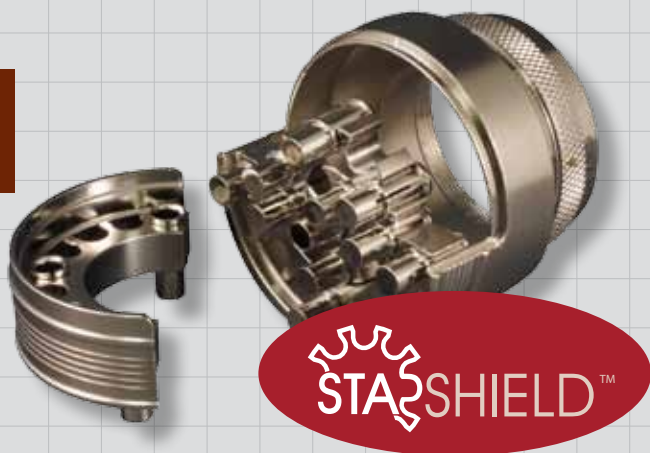


Dimensions in inches (millimeters) and are subject to change without notice.



Introduction to StarShield™ Shield Termination Backshells

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Product Features

- The unique StarShield™ configuration completely eliminates “standing antenna” problems common with pigtail shield termination systems.
- The backshell utilizes familiar heat shrink termination (HST) sleeve technology for fast and reliable termination of shielding—even with dissimilar wire types and gauges.
- The StarShield™ system is available in a standard configuration featuring a threaded compression nut and a tapered split-ring that fits snugly into a conical backshell or a lightweight split banding version.
- Available fittings include EMI shield termination and shrink-boot backshells.

“Zero Length” Individual Shield Termination Backshells

The Glenair Series 470-013 StarShield™ “Zero Length” Individual Shield Termination Backshell offers optimal grounding of EMI/EMP braided shielding. The unique StarShield™ configuration completely eliminates the need for the termination of additional shield drain wires or pigtails. The backshell utilizes familiar solder sleeve technology for fast and reliable termination of shielding—even with dissimilar wire types and gauges. The internal configuration of the StarShield™ features a tapered split-ring that fits snugly into the conically machined backshell. Tightening the coupling nut in place effects 360° grounding of all conductive surfaces. Standard designs include banding and shrink-boot versions.

Test Description	StarShield™ Performance Requirements	Procedure
Magnetic Permeability	Relative permeability less than 2.0 for aluminum and 5.0 for stainless steel.	EIA-364.54
DC resistance	Resistance was measured between connector/fixture, and ferrule or a point near the end of the cable shield. Cable shield resistance was subtracted when measuring to a point near the end of the cable shield. The DC resistance did not exceed 5 milliohms after conditioning.	EIA-364.6
Durability	Backshells subjected to 10 cycles of assembly and disassembly (not including HST device). Showed no evidence of damage detrimental to performance.	GPS470013
Temperature Cycling	Condition IV, 5 cycles, except steps 2 and 4 were 2 minutes maximum duration. The temperature of step 1 was -65°C and temperature of step 3 was +200°C for nickel-plated Backshells with nickel-plated copper braids, +175°C for cadmium plated Backshells or silver-plated braids, or +150°C for tin-plated copper braids. After conditioning, Backshells met the subsequent performance requirements and showed no evidence of damage detrimental to performance.	EIA-364.32, condition IV and GPS470013
Temperature Aging	Backshells were subjected to maximum operating temperatures for a period of 1,000 hours. After conditioning, Backshells met the subsequent performance requirements and showed no evidence of damage detrimental to performance.	GPS470013
Coupling Thread Strength	After testing, backshell showed no evidence of damage detrimental to performance.	SAE AS85049 category 3A
Vibration	Backshell was torqued to a suitable test fixture representative of an actual connector. Cable bundle was clamped or otherwise secured at 10.0 +/- .5 inches from the test fixture. After testing, Backshell showed no evidence of loosening or damage detrimental to performance with no discontinuities >1g5.	EIA-364.28 Condition VI, letter J 8 hrs/axis, monitored
Shock	The pulse was approximate half sine wave of 300 G ± 15 percent magnitude with duration of 3 ± 1 milliseconds. The wire bundle was clamped or otherwise secured at 10.0 +/- .5 inches from the test fixture. After testing, Backshell showed no evidence of loosening or damage detrimental to performance with no discontinuities >1g5.	EIA-364.27
Bending Moment	After testing, backshell showed no evidence of loosening or damage detrimental to performance.	AS85049, category 3A (heavy duty)
Cable Pull-out	A minimum of one ferrule per backshell was tested and wired with 4 shielded twisted pairs. DC resistance was monitored during the test. DC resistance during the test did not exceed 7 milliohms.	EIA364.38, condition E (25lbs)
Salt-Spray (Corrosion)	The samples were suspended from the top of the chamber using waxed twine or string, glass rods or glass cord. StarShield™ backshells showed no signs of basis metal exposure which may affect performance as defined in AIR4789	EIA364.26 test condition letter A (96hrs) and test condition letter C (500hrs)
Fluid Immersion	One sample per fluid. StarShield™ backshell and HST devices showed no signs of swelling, cracking or other evidence of damage detrimental to performance.	EIA-364.10
Shielding effectiveness	One representative medium size StarShield™ backshell was fitted to a brass or copper fixture, wired with copper tubes and tested in accordance with VG95373-41. Shielding effectiveness was greater than 98 dB at 30 MHz and 90 dB at 100 MHz	VG95373-41

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StarShield™ Zero Length Shield Termination Catalog

CAGE Code 06324

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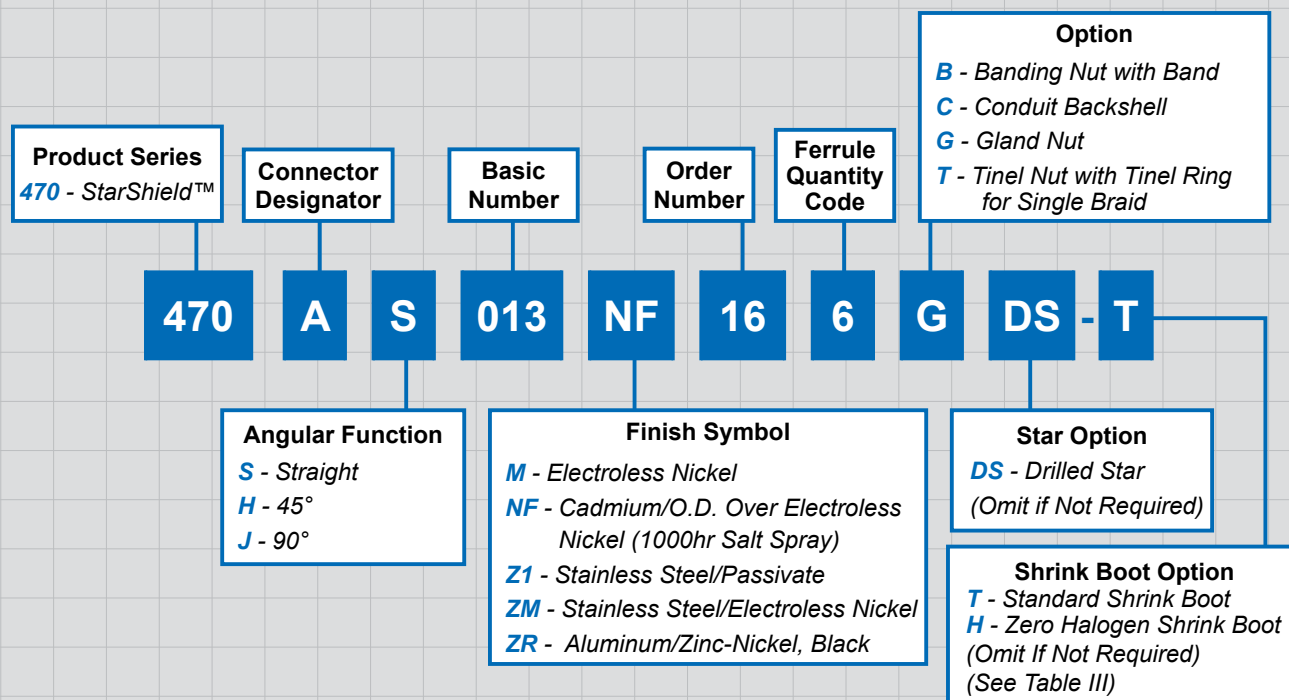
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StarShield™ Shield Termination Backshells How To Order



How to Order StarShield™ Shield Termination Backshells

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Connector Designator Table					
A		F		H	
Connector Specification	Series	Connector Specification	Series	Connector Specification	Series
MIL-DTL-5015	MS3400	MIL-DTL-38999	I & II	MIL-DTL-38999	III & IV
MIL-DTL-26482	2	30M38277		EN3645	
MIL-C-81703	3	NFC93422	HE308	CECC75201.002	
MILL-DTL-83723	I & III	NFC93422	HE309		
40M39569		PAN6433-1			
CECC 7521.001		PATT 641			
DEF 5326-3		PATT 616			
EN 2997					
EN 3646					
ESC 10					
ESC 11					
LN 29504					
NFC 93422	HE302				
PAN 6432-1					
PAN 6432-2					
PATT 602					

* Caution: these connector interfaces are not suitable for total environmental sealing; for further information consult factory.

Consult factory for connector types not listed

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Glenair StarShield™ Assembly Procedure

1) Application Equipment

Glenair recommends the use of a Bak Rion Model 5100726 1600W hot-air-gun with a 34mm sieve spoon reflector (or equivalent system). Clamp the hot-air-gun in a bench mounted vice or comparable fixture to stabilize, with the reflector nozzle pointed upwards.

Hot air gun settings

With the air-gun vent open and appropriate reflector nozzle installed, set the hot air gun as follows:



For installation of protective sleeves:

Use setting of 4-5 or 450°- 520°F (230°- 270°C)

For installation of the heat shrinkable terminator (HST):

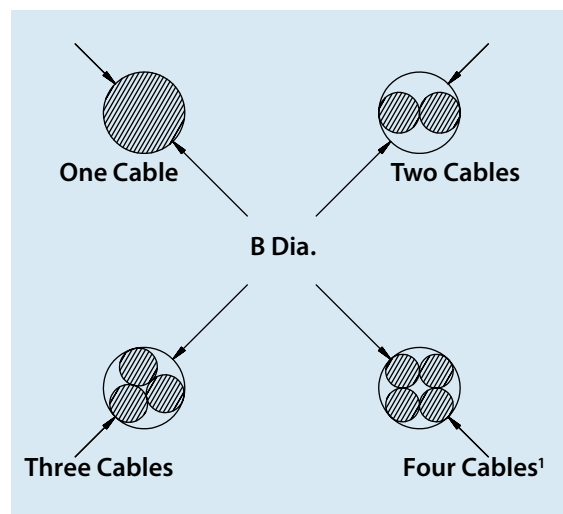
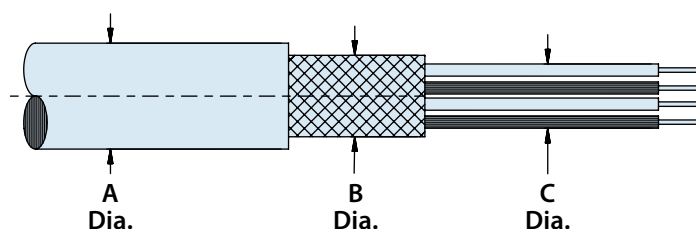
Use setting of 8-9 or 720°- 790°F (380°- 420°C)

While the hot air gun is warming, take a moment to check that all necessary StarShield™ assembly equipment is ready to terminate, and that extra components are on hand in case of a mis-termination.

2) Cable Preparation

Single or multi-conductor shielded cables meeting the envelope dimensions below may be used in any combination not to exceed 4 braids per ferrule.

Figure 1



1) Refer to Figure 3 for Special Instructions

Envelope Diameters					
Size	Ø A		Ø B		Ø C
	Min.	Max.	Min.	Max.	Max
687-76A-02*	.122 (3.1)	.271 (6.9)	.094 (2.4)	.208 (5.3)	.165 (4.2)
687-76A-04*	.169 (4.3)	.350 (8.9)	.094 (2.4)	.244 (6.2)	.165 (4.2)

* Finish Code

Please see section D of this Catalog for tool ordering information

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Glenair StarShield™ Assembly Procedure



The filling factors listed below may be used as a guideline in determining the number of wires per ferrule. Actual fit-checks should be performed to ensure feasibility.

Circular Connectors

Connector	
Size	AWG 22 Contact Qty
9-35	6
11-35	13
13-35	22
15-35	37
17-35	55
19-35	66
21-35	79
23-35	100
25-35	128

StarShield™					
Size	Ferrule Qty	AWG 22 Shielded Wire Maximum Qty	Filling Factor	AWG 20 Shielded Wire Maximum Qty	Filling Factor
9	1	8	100%	6	100%
11	2	16	100%	12	92%
13	3	24	100%	18	82%
15	5	40	100%	24	37%
17	6	48	87%	36	55%
19	7	56	85%	42	64%
21	9	72	91%	54	68%
23	10	80	80%	60	60%
25	12	96	75%	72	56%

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ARINC 600 Connectors

Connector	
ARINC 600 Size	AWG 22 Contact Qty
2	300
3	600

StarShield™					
Size	Ferrule Qty	AWG 22 Shielded Wire Maximum Qty	Filling Factor	AWG 20 Shielded Wire Maximum Qty	Filling Factor
21	18	144	48%	108	36%
21	36	288	48%	216	36%

- With an AWG 22 (wire OD .039"/1.0mm), a ferrule can accept up to 4 screened twisted pairs (8 wires total)
- With an AWG 20 (wire OD .051"/1.3mm), a ferrule can accept up to 3 screened twisted pairs (6 wires)
- Filling factors can be increased if unshielded wires are used by routing them through a drilled star.

StarShield Cable Length Preparation

Table I	
Angular Function and Connector Size	Length Constant
45° & 90° Circular 9	1.60
45° & 90° Circular 11 & 13	1.74
45° & 90° Circular 15 & 17	2.03
45° & 90° Circular 19	2.13
45° & 90° Circular 21	2.48
45° & 90° Circular 23	2.61
45° & 90° Circular 25	2.76
Straight Circular All Sizes	1.82

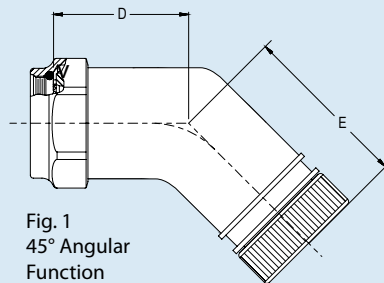


Fig. 1
45° Angular Function

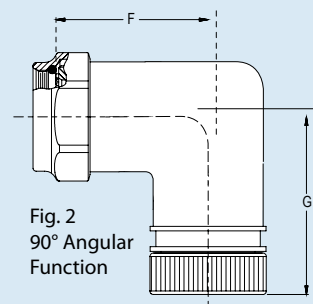


Fig. 2
90° Angular Function

To calculate the cable length, see Table I (at left) to establish the *length constant* according to the connector designator's size and angular function. Then use the formula below to calculate the total length

$$45^\circ L = \text{Length constant} + D + E$$

Example:
470HT017XM176G
 $L = 2.03 + 0.81 + 1.20 = 4.04$ in.

$$\text{Straight } L = \text{Length constant} + \text{Straight length}$$

Example:
470HS017XM176G
 $L = 1.82 + 1.11 = 2.93$ in.

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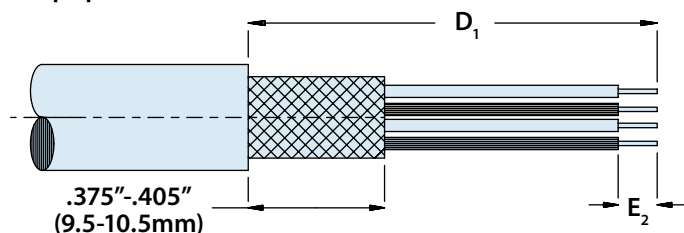
Glenair StarShield™ Assembly Procedure

Figure 2

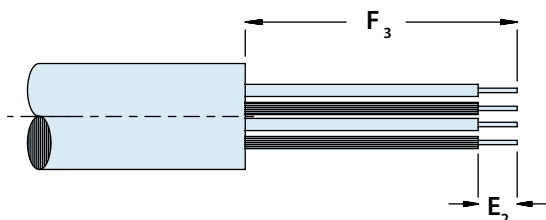
.375"-.405"
(9.5-10.5mm)



HST preparation dimension

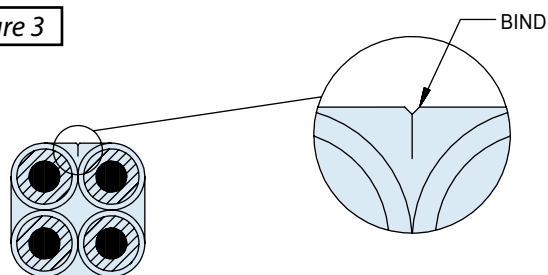


Adhesive Sleeve preparation dimension

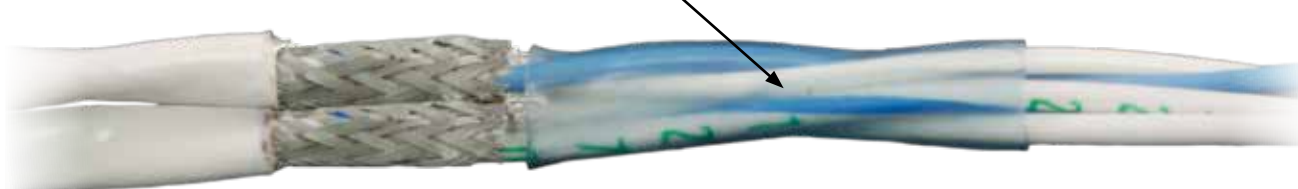


1. D_1 Dimension allows for at least one repair of the crimp contact.
2. E_2 Dimension determined by crimp contact mfgs. instructions
3. F_3 Dimension for adhesive sleeve allows for at least one repair of the crimp contact

Figure 3



Heat Shrinkable Protective Sleeve



Please see section D of this Catalog for tool ordering information

Strip the cables according to the following dimensions.

Backshell Style	Size	D Dim ±.02" (0.5mm)	F Dim ±.02" (0.5mm)
Straight ARINC 600	All	3.23 (82)	2.83 (72)
Straight Circular	All	3.07 (78)	2.67 (68)
45° & 90° Circular	9	3.35 (85)	2.95 (75)
45° & 90° Circular	11 & 13	3.54 (90)	3.14 (80)
45° & 90° Circular	15 & 17	3.94 (100)	3.54 (90)
45° & 90° Circular	19	4.13 (105)	3.73 (95)
45° & 90° Circular	21	4.53 (115)	4.13 (105)
45° & 90° Circular	23	4.72 (120)	4.32 (110)
45° & 90° Circular	25	4.92 (125)	4.52 (115)

Make sure not to fray braided shielding ends. Contacts may be installed at this time if desired, provided their size is not so great as to prevent the leads to pass through the ferrule.

3) Assembly

Arrange prepared cables into bundles in accordance with plan. (See figure 1 in step 2)

For applications with 4 braids, we recommend the use of a solid tin plated copper wire Ø.008-.016" (0.2-0.4mm) to bind the shields securely during the installation. Secure them together as shown in figure 3. Trim ends to .20" (5mm) long and fold flat along length of cable.

Using the hot air gun (see step 1), install provided .75" (19mm) protective sleeve directly adjacent the stripped braid. This will prevent the wire conductors from getting pinched in the ferrule slot as well as keeping the wire bundle well managed throughout the rest of the assembly process.

Dimensions in inches (millimeters) and are subject to change without notice.

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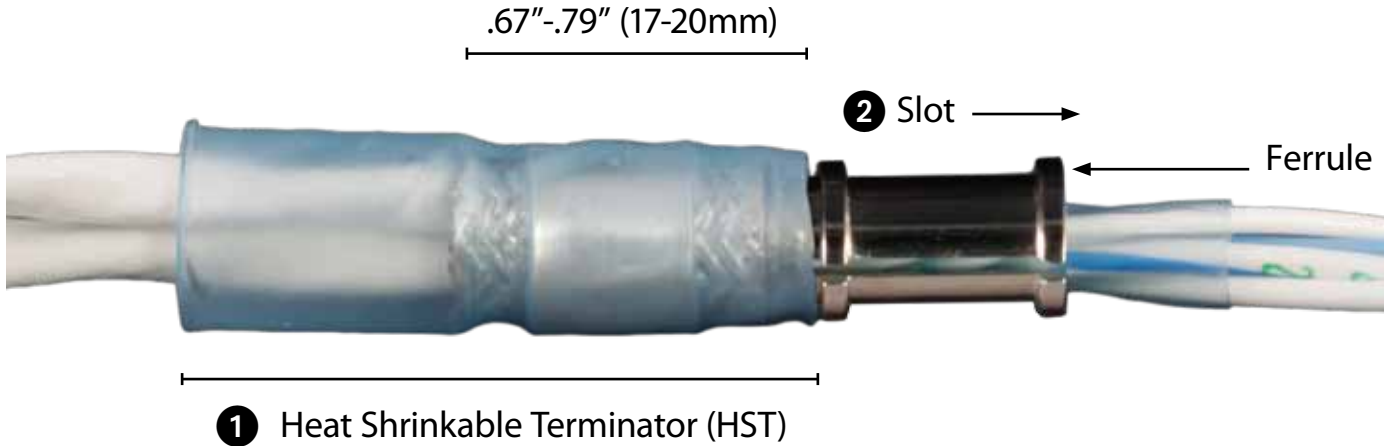
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Glenair StarShield™ Assembly Procedure



- ❶ Stage the StarShield™ HST over the cable bundle, positioning the solder preform directly over the stripped section of braided shielding.

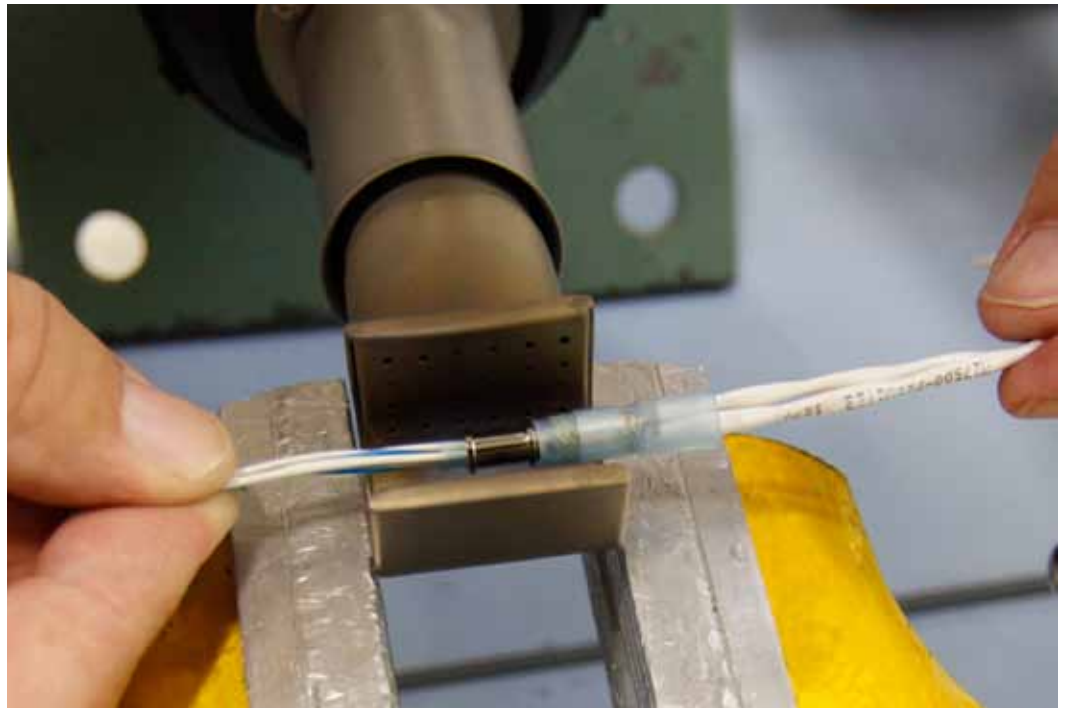


- ❷ Next, carefully slide the StarShield™ ferrule (with slotted side oriented towards contacts) over the leads until the non-lipped end slides under the HST braid. Cable jacketing should be positioned on the ferrule as shown above.

4) Termination Procedure

Check that the hot-air-gun is set to the recommended setting and has been allowed to warm up for 1 minute.

Position cable and staged ferrule/HST in the center of the hot-air-gun reflector, being careful not to touch the outer heat shrink material to the reflector.

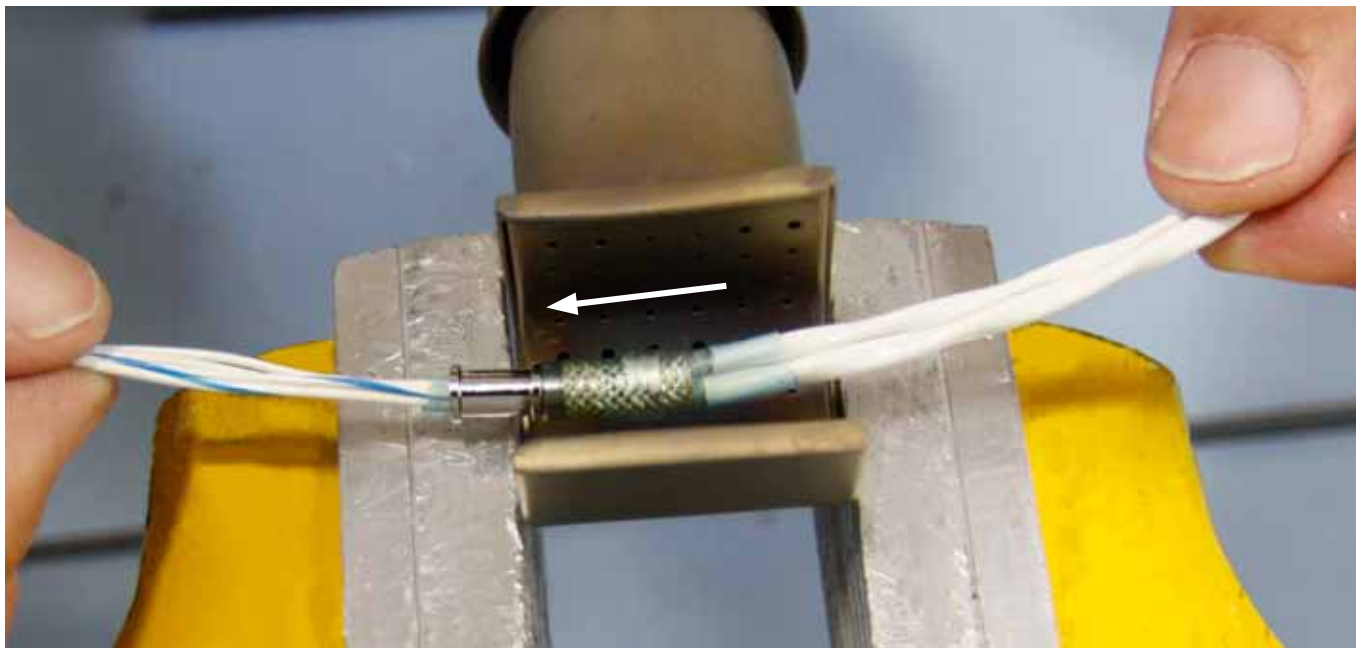


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Glenair StarShield™ Assembly Procedure

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Focus heat on ferrule for a few seconds and begin moving towards the solder preform. Solder should melt and begin to flow freely. Continue to move the preform towards the center of the heat reflector as solder completely melts and flows along preform braid.

Heat until shrink sleeve has fully recovered around preform assembly and solder has completely melted and flowed through copper braid (approximately 15-45 seconds). Some solder flowing over the stripped cable braids should be seen. The solder will take on a lustrous appearance when properly melted. (Note: luster will subside as preform assembly cools to ambient temperature).



Be careful not to overheat preform assembly and scorch outer shrink sleeve. Slight browning of outer shrink sleeve is acceptable, but severe discoloration is indicative of improper termination.

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Glenair StarShield™ Assembly Procedure

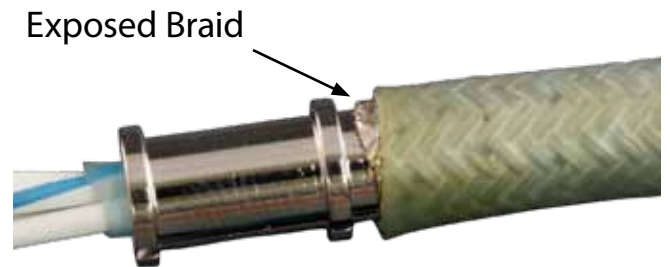


5) Inspection

Allow the ferrule and HST assembly to cool completely before touching with bare hands.

Check for cuts, splits or charred spots in the outer heat shrink sleeve. A complete discolored dark brown sleeve indicates an overheated termination. A slight browning of the sleeve is acceptable.

Make sure that no braid strands are exposed from under the sleeve. If any such damage is evident, remove damaged sleeve and replace with new heat shrinkable sleeve Glenair part number 687-808-02 or 687-808-04.



If solder has not completely melted and flowed within the preform assembly and/or outer heat shrink sleeve has not fully recovered, reheating may be necessary.



6) Repair

Reheat incompletely melted terminations to obtain proper solder flow and/or fully recovered sleeve onto the cable jacket. If the outer shrink sleeve has split during the assembly process, it must be replaced. To do so, cut away existing (damaged) shrink sleeve with snips and carefully remove from solder preform. Slide replacement heat-shrinkable sleeve (Glenair P/N 687-808-**) over terminated solder preform, leaving roughly .06" (1.5mm) of overlap on the braid/ferrule transition point. Heat new shrink sleeve until it recovers fully around preform and wires, making sure to constantly move it within the hot air gun reflector to ensure even heating and recovery. Once the new shrink sleeve is fully recovered, remove assembly from the hot air gun and allow the assembly to cool before proceeding with subsequent steps. Repeat inspections per step 5.



Glenair StarShield™ Assembly Procedure

7) Replacement

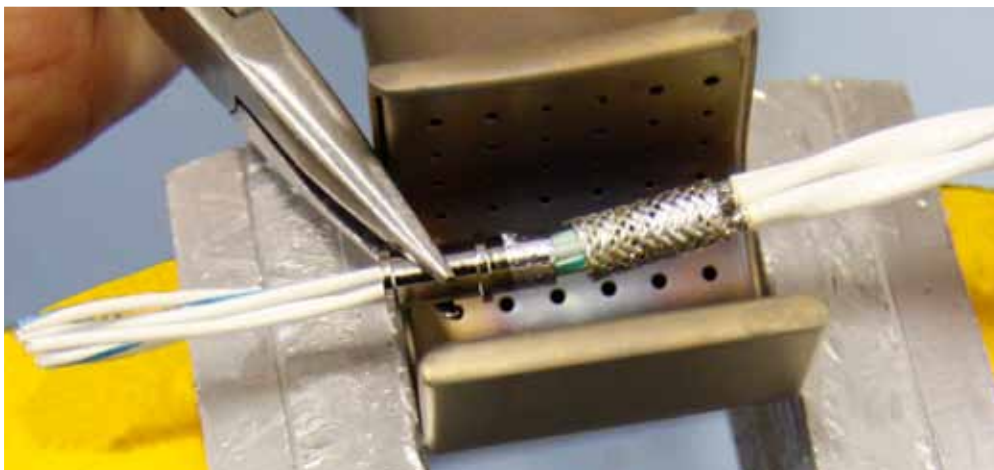
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In the case of severely damaged StarShield™ HST assemblies, complete removal and re-termination may be necessary. Users will need a hot air gun fixed in a bench mount (see step 1), needle nose pliers and an unused StarShield™ HST kit (Glenair part number 687-764-***)

Set hot-air-gun to recommended setting (see step 1) and allow to warm up for one minute.

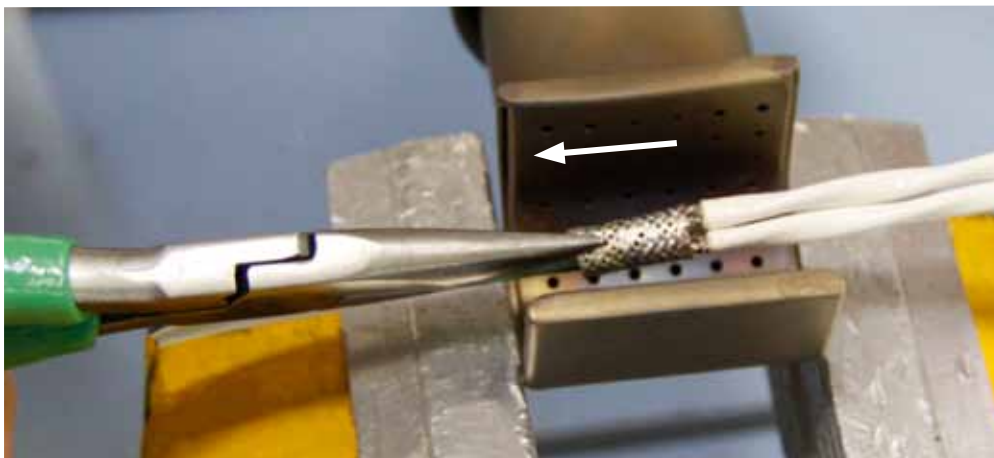
Remove outer heat shrink sleeve completely, being careful not to cut or damage wire jacketing.

With needle nose pliers firmly planted on end of ferrule, place StarShield™ ferrule/HST in hot air gun and allow solder to melt and flow. Once solder is molten, gently pull ferrule away from braided preform and slide off wires. Remove assembly from heat and set aside.



Next, grasp preform braid with needle nose pliers and return assembly to hot air gun reflector. When solder begins to melt, gently pull preform braid away from cable. Remove from heat and allow to cool.

Once assembly cools to ambient temperature, use fingers to gently scrape residual solder off cable jacketing and protective sleeve.



Re-terminate with a new StarShield™ HST (Glenair part number 687-764-***) and inspect for damage per previous instructions.

Please see section D of this Catalog for tool ordering information

Glenair StarShield™ Assembly Procedure



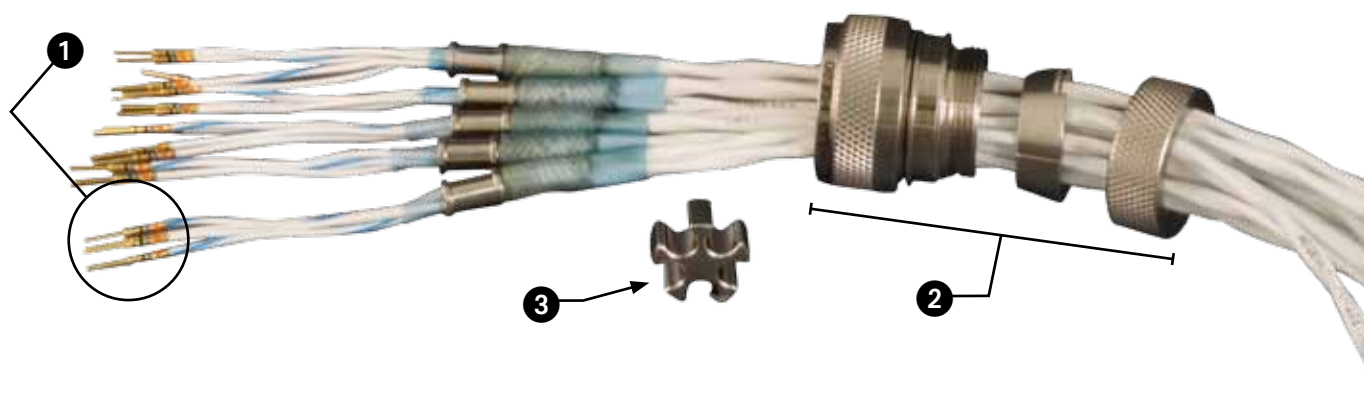
8) Assembly of StarShield™ Backshells

Install HST/ferrules onto cables per steps 1 through 4.

❶ Terminate crimp contacts onto leads per Glenair crimping instructions, or follow appropriate connector manufacturer's contact procedure.

❷ Slide the gland nut, compression ring and backshell body/coupling nut assembly over the cable bundle—paying special attention to the order and orientation of each component.

❸ For backshells with drilled stars, route the wires that pass through the center hole of the star before inserting the contacts into the connector. See split star configurations in step 9 for further instruction.



Using appropriate insertion tools, insert terminated contacts into the connector per Glenair insertion instructions, or per connector manufacturer's procedure.

Please see section D of this Catalog for tool ordering information



Glenair StarShield™ Assembly Procedure

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Hand tighten the backshell body/ coupling nut assembly onto the connector accessory threads until anti-rotation teeth engage. Once threads have engaged and anti-rotation teeth are sitting peak-to-valley, begin tightening with assembly tool to specified torque value. We suggest the connector be mated to an appropriate holding tool (see Glenair tools catalog) before final tightening takes place. Continue to tighten the coupling nut until specified torque value has been reached (see chart below for values). Effective EMI grounding is dependent upon proper tightening of backshell to connector body. Snap ferrules into place on the StarShield™ "star."



Installation Torque Values for Circular Electrical Connector Accessories

Accessory Thread Torque: $\pm$ inch pounds

Shell Sizes	Group 1 Light & Medium Duty	Group 2 Heavy Duty	Group 2
	MIL-C-5015 (MS3100 Series) MIL-C-26482 Series I MIL-C-26500 MIL-C-27599 MIL-C-38999 Series I, II MIL-C-81511 Series I, II, III, IV MIL-C-81703 Series I	MIL-C-5015 (MS3400 Series) MIL-C-22992 MIL-C-26482 Series II MIL-C-28840 MIL-C-38999 Series III, IV MIL-C-81703 Series III MIL-C-83723 Series I, II, III	Values for Hand Held Tool Applications Field Repair Torque
8, 9, A	35	56	40 - 50
3, 10, 10SL, 11, B	35	76	40 - 50
7, 12, 12S, 13, C	40	108	40 - 50
14, 14S, 15, D	40	116	50 - 60
16, 16S, 17, E	40	116	50 - 60
18, 19, 27, F	40	116	50 - 60
20, 21, 37, G	80	136	80 - 90
22, 23, H	80	136	80 - 90
24, 25, 61, J	80	136	80 - 90

Notes:

Values based on 80% of MIL-C-85049 thread strength.

Use group 1 values for all composite connector accessories.

When tightened with Glenair

600-091 And 600-007 torque tools. Consult factory.

Dimensions in inches (millimeters) and are subject to change without notice.

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Glenair StarShield™ Assembly Procedure



Introduction to
StarShield™

A

9) Split Star Configurations

For star-in-star or split star configurations, install ferrules starting from the inner star or ferrule slot. Position conical ring on the star.

Position the sub-assemblies (stars, compression ring and ferrules) into the body by carefully twisting to “birdcage” the individual wire pairs first and then the entire wire bundle in a counter clockwise motion. If necessary, heat may be applied to the wires to make them more pliable and easier to fit into backshell body (Hot air gun setting 4–5 or 450°–520°F/230°–270°C with reducer nozzle).



Glenair StarShield™ Assembly Procedure

A

Apply heat, then push and twist the wires until the gland nut threads engage the threads on the body.



Tighten the gland nut on the body to the appropriate torque value.



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Glenair StarShield™ Assembly Procedure



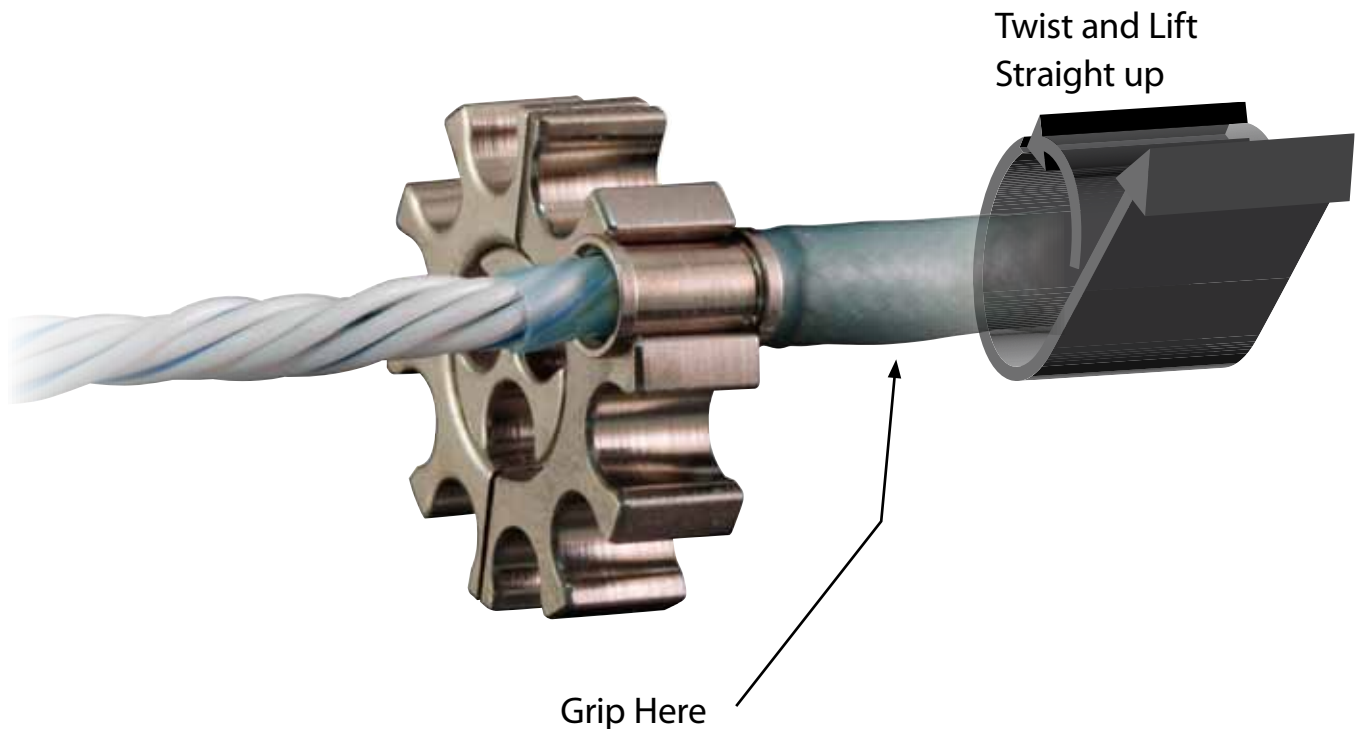
Introduction to
StarShield™

Glenair recommends the use of an appropriately sized Series 600 backshell holding wrench, TG70 strap wrench, or TG69 soft jaw pliers. (These tools are used to grip the self-locking coupling nut. Any one of the three will do the job.) Connector plug or receptacle holder: These tools take the form of a socket device used in conjunction with a torque wrench, either hand held (600-161) or bench mounted (600-162). These tools are used to hold the inner body of the connector in place while the StarShield™ Backshell coupling nut and clamping nut are torqued onto the back. Note: most holder series tools provide "universal polarization", but a few connector series require specific polarization for each alternate keying arrangement. Please see section D of this Catalog for tool ordering information

A

10) Dismantling StarShield™ Backshells:

Dismantling is the reverse of the assembly. To remove a ferrule from a star, grip the ferrule assembly as close to the star as possible. Carefully twist and lift the ferrule straight up from the ferrule slot in the star. Do not remove the ferrule by lifting or pulling on the cable or wires only, or damage to the termination may result. For maximum contact extraction tool access, unclip all ferrules from the star, remove the star from the cable bundle before pushing the backshell body towards the cable.



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AmberStrand®

THE ULTRA- LIGHTWEIGHT MICROFILAMENT METAL CLAD EMI/ RFI COMPOSITE BRAIDING

MICROFILAMENT NICKEL CLAD STAINLESS STEEL BRAID

- Metal-clad EMI/RFI Shielding with a lightweight composite thermoplastic base material
- Highly conductive surface plating
- Reduce shielding weight up to 80% and more
- Reduce operation costs by permanently reducing launch and aircraft all-up weights
- Superior high frequency shielding compared to tinned and/or nickel plated copper
- Exceptional tensile strength: 590,000 psi (min)



StarShield™ Backshell General Information



StarShield™ Zero Length Termination Backshells

EMI/RFI backshells with heat shrink termination (HST) sleeves provide superior shielding performance and effectiveness in shielded twisted pair cable applications.



Product Features

- The unique StarShield™ configuration completely eliminates “standing antenna” problems common with pigtail shield termination systems.
- The backshell utilizes familiar heat shrink termination (HST) sleeve technology for fast and reliable termination of shielding—even with dissimilar wire types and gauges.
- The internal configuration of the StarShield™ features a tapered split-ring that fits snugly into the conically machined backshell or a lightweight band-terminated compression system adapter.
- Available fittings include overbraid termination, conduit or shrink-boot adapters.
- Available for all standard MIL-AERO circular connector series, and many popular rectangular connector series.
- Environmental sealing, self-locking coupling nuts standard on StarShield™ backshells for select popular connector series
- Optional shrink boots also available.
- StarShield™ termination technology can be adapted to additional connector/backshell types not shown

Part No.	Description	Page No.
83723 Series I & III, 5015 MS400 Series, AS81703 Series 3, and MIL-C- 26482 Series 2		
470-013	StarShield™ environmental EMI/RFI shield termination backshell with self-nestor rotatable coupling nut and rear end options	B-2
470-015	StarShield™ environmental backshell with self-locking rotatable coupling nut and rear end options	B-4
38999 Series I and II Connectors		
470-013	StarShield™ non-environmental, high ferrule count, EMI/RFI shield termination backshell with self-nestor rotatable coupling nut	B-6
470-015	StarShield™ non-environmental, high ferrule count, EMI/RFI shield termination backshell with self-locking rotatable coupling nut	B-8
38999 Series III and IV Connectors		
470-013	StarShield™ non-environmental, high ferrule count, EMI/RFI shield termination backshell with self-locking rotatable coupling nut	B-10
470-014	StarShield™ environmental EMI/RFI shield termination backshell with self-nestor rotatable coupling nut and rear end options	B-12
470-015	StarShield™ extended length, environmental, EMI/RFI backshell with self-locking rotatable coupling nut and shrink boot	B-14
470-017	StarShield™ composite, EMI/RFI shield termination backshell with self-locking rotatable coupling nut and shrink boot	B-16
470-019	StarShield™ split shell, high ferrule count, EMI/RFI shield termination backshell with self-locking rotatable coupling nut	B-18
470-020	StarShield™ split shell, non-environmental, EMI/RFI shield termination backshell with high ferrule count	B-20
477-004	StarShield™ environmental, extended length, EMI/RFI backshell with high ferrule count and self-nestor coupling	B-22
477-005	StarShield™ 90°, extended length, environmental, EMI/RFI shield termination backshell with self-nestor coupling	B-24
477-006	StarShield™ 30° environmental, high ferrule count, EMI/RFI shield termination backshell backshell with self-nestor coupling	B-26
477-007	StarShield™ environmental, extended length EMI/RFI shield termination backshell with self-nestor coupling	B-28
477-008	StarShield™ 30°, environmental, high ferrule count, EMI/RFI shield termination backshell with self-nestor coupling	B-30
477-009	StarShield™ environmental, EMI/RFI shield termination backshell with self-nestor and rear end options	B-32
800 Series Mighty Mouse connectors		
470-021	StarShield™ direct coupling, Mighty Mouse, EMI/RFI shield termination backshell with split banding porch	B-34
477-013	StarShield™ direct coupling, Mighty Mouse, EMI/RFI shield termination backshell with split banding porch	B-36
StarShield Backshells for Rectangular Connectors		
527-448	StarShield™ non environmental, EMI/RFI shield termination backshell assembly for size 2 ARINC 600	B-38
527-449	StarShield™ non-environmental, high ferrule count, EMI/RFI shield termination backshell assembly for size 2 ARINC 600	B-40
527-450	StarShield™ shield termination, EMI/RFI shield termination backshell with banding porch for Collins SGA3 connector	B-42
550-089	StarShield™ non-environmental shield termination backshell with cable entry and receptacle mounting options for D-Subminiature	B-44

Dimensions in inches (millimeters) and are subject to change without notice.



470-013

StarShield™ EMI/RFI Shield Termination Backshell
for MIL-DTL-83723 Series I & III, 5015 MS400 Series, AS81703
Series 3, and MIL-C- 26482 Series 2

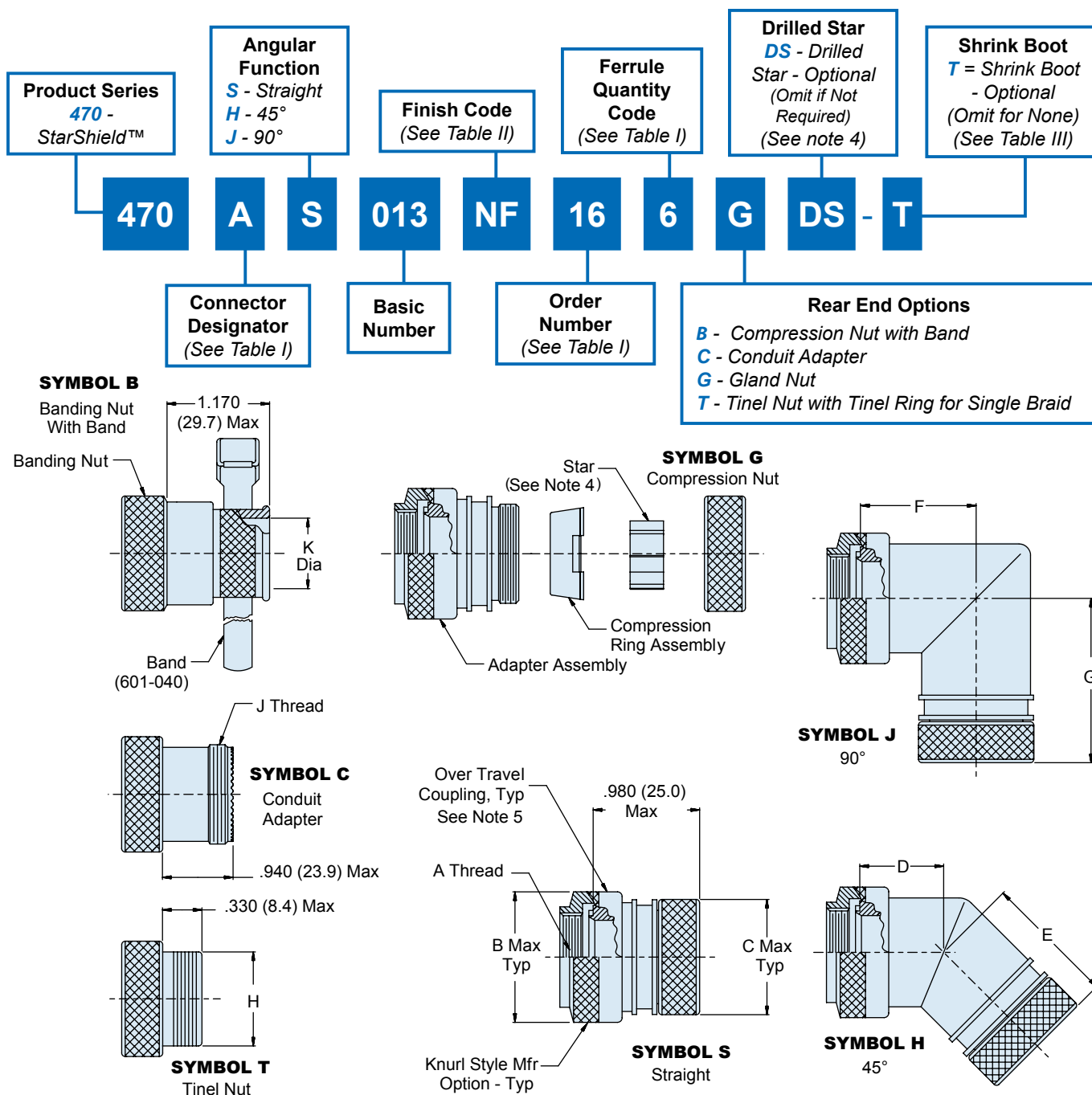


Environmental

Self
NestorRear End
OptionsStandard
LengthHigh
Ferrule Count

StarShield™ environmental backshell with self-nestor coupling and rear end options

B



Dimensions in inches (millimeters) and are subject to change without notice.

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470-013
StarShield™ EMI/RFI Shield Termination Backshell
for MIL-DTL-83723 Series I & III, 5015 MS400 Series, AS81703
Series 3, and MIL-C- 26482 Series 2



Table I: Dimensions

Order No.	Connector Shell Size				A Thread Class 2 B	B Dia Max	C Dia Max	D Max
	MIL-DTL-83723 Series I & III	MIL-DTL-5015 MS3400 Series	AS81703 Series III	MIL-C-26482 Series II				
08	8	8S	-	8	1/2-20 UNF	.630 (16.0)	.690 (17.5)	.490 (12.5)
10	10	10S, 10SL	-	10	5/8-24 UNEF	.870 (22.0)	.850 (21.5)	.510 (13.0)
12	12	12, 12S	7	12	3/4-20 UNEF	1.000 (25.4)	.890 (22.5)	.550 (14.0)
14	14	14, 14S	12	14	7/8-20 UNEF	1.180 (30.0)	1.000 (25.4)	.570 (14.5)
16	16	16, 16S	19	16	1-20 UNEF	1.300 (33.0)	1.120 (28.5)	.590 (15.0)
18	18	18	27	18	1 1/16-18 UNEF	1.460 (37.0)	1.240 (31.5)	.610 (15.5)
20	20	20	37	20	1 3/16-18 UNEF	1.500 (38.0)	1.380 (35.0)	.650 (16.5)
22	22	22	-	22	1 5/16-18 UNEF	1.610 (41.0)	1.500 (38.0)	.670 (17.0)
24	24	24	-	24	1 7/16-18 UNEF	1.810 (46.0)	1.610 (41.0)	.710 (18.0)

Table I: Dimensions (continued)

Order No.	E Max	F Max	G Max	H ± .003 (.08)	J Thread Class 2 A	K ± .004 (.10)	Ferrule Quantity (See Note 4)	
							Std.	Opt.
08	1.000 (25.4)	.630 (16.0)	1.140 (29.0)	.435 (11.0)	1/2-20 UNF	.315 (8.00)	1	-
10	1.020 (26.0)	.690 (17.5)	1.200 (30.5)	.623 (15.8)	5/8-24 UNEF	.531 (13.5)	2	-
12	1.040 (26.5)	.750 (19.0)	1.260 (32.0)	.746 (18.9)	3/4-20 UNEF	.591 (15.0)	3	-
14	1.080 (27.5)	.810 (20.5)	1.320 (33.5)	.871 (22.1)	7/8-20 UNEF	.709 (18.0)	5	-
16	1.100 (28.0)	.870 (22.0)	1.380 (35.0)	.996 (25.3)	1-20 UNEF	.827 (21.0)	6	7
18	1.120 (28.5)	.930 (23.5)	1.440 (36.5)	1.121 (28.5)	1 1/16-18 UNEF	.945 (24.0)	7	-
20	1.140 (29.0)	1.000 (25.4)	1.520 (38.5)	1.245 (31.6)	1 3/16-18 UNEF	1.063 (27.0)	9	11
22	1.180 (30.0)	1.060 (27.0)	1.570 (40.0)	1.371 (34.8)	1 5/16-18 UNEF	1.181 (30.0)	10	13
24	1.220 (31.0)	1.120 (28.5)	1.630 (41.5)	1.371 (34.8)	1 7/16-18 UNEF	1.299 (33.0)	12	17

Table II: Material and Finish Options

Code	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
Z1	Stainless steel; passivate
ZM	Stainless steel; electroless nickel

Table III: Shrink Boot

Shell Size	Shrink Boot Part Number
08	770-001S1 04
10	770-001S1 06
12	770-001S1 06
14	770-001S1 07
16	770-001S1 07
18	770-001S1 08
20	770-001S1 08
22	770-001S1 08
24	770-001S1 09

Notes:

1. Assembly identified with manufacturer's name, part number and date code, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 Series Backshell Assembly Tools are recommended for assembly and installation.
4. Star not supplied with Order Number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule quantity per Table I is selected, one split and one solid star will be supplied.
5. Over-travel coupling design provides self-seating and self-locking functionality, eliminating lock-wire requirements.
6. Ferrule kit sold separately.
687-764 ferrule and HST device kit
687-809 ferrule and sealing device kit
687-748 solder ferrule
687-841-01 HST flex device

Material/Finish:

Backshell, elbows, coupling and gland nut, compression ring and star	Aluminum alloy or CRES/Table III
Tinel ring	Nickel-titanium alloy/n.a.
Band	CRES/passivate

Dimensions in inches (millimeters) and are subject to change without notice.



470-015

StarShield™ EMI/RFI Shield Termination Backshell
for MIL-DTL-83723 Series I & III, 5015 MS400 Series, AS81703
Series 3, and MIL-C- 26482 Series 2



Environmental

Self
LockingRear End
OptionsStandard
LengthHigh
Ferrule Count

StarShield™ environmental backshell with self-locking coupling and rear end options

Product Series
470 -
StarShield™

470

**Angular
Function**
S - Straight
H - 45°
J - 90°

A**S**

Finish Code
(See Table II)

015

**Ferrule
Quantity Code**
(See Table I)

16**6**

Drilled Star
DS - Drilled Star - Optional
(Omit if Not Required)
(See note 4)

G**DS****-****T**

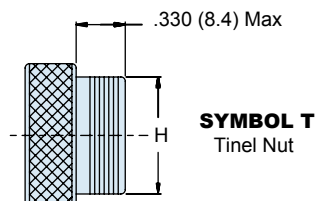
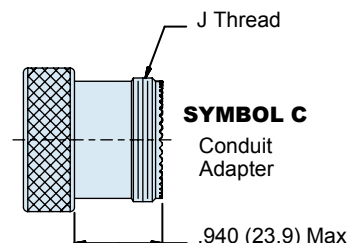
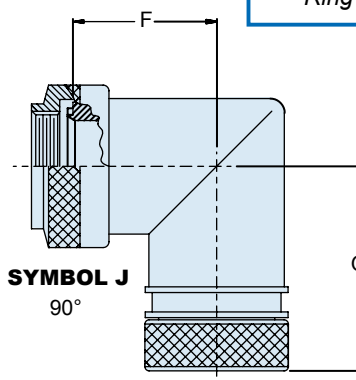
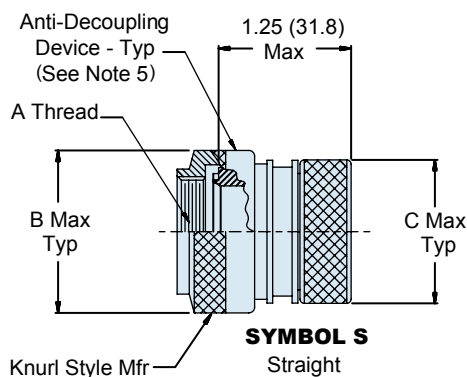
**Connector
Designator**
(See Table I)

**Basic
Number**

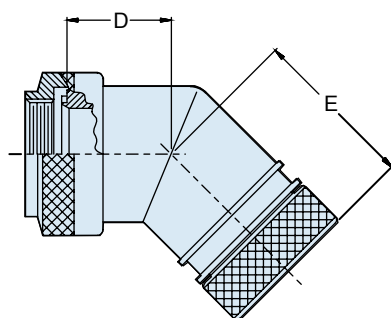
**Order
Number**
(See Table I)

Rear End Options
B - Compression Nut
with Band
C - Conduit Adapter
G - Gland Nut
T - Tinel Nut with Tinel
Ring for Single Braid

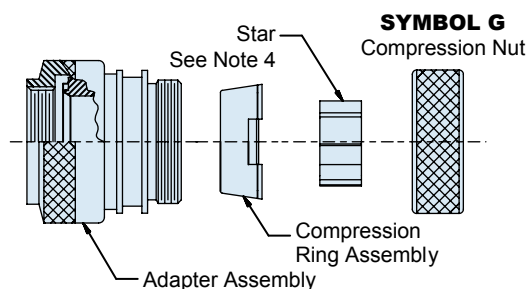
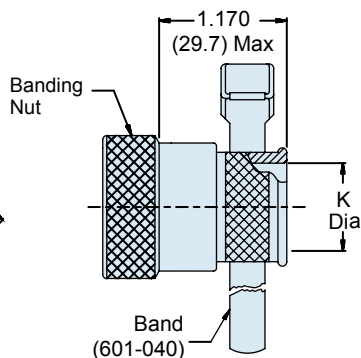
Shrink Boot
T - Shrink Boot -
Optional
(Omit for None)
(See Table III)



SYMBOL H
45°
Option - Typ



SYMBOL B
Banding Nut with Band



Dimensions in inches (millimeters) and are subject to change without notice.

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StarShield™ EMI/RFI Shield Termination Backshell
for MIL-DTL-83723 Series I & III, 5015 MS400 Series, AS81703
Series 3, and MIL-C- 26482 Series 2



Table I: Dimensions

Order No.	Connector Shell Size				A Thread Class 2 B	B Max	C Dia Max	D Max	E Max
	MIL-DTL-83723 Series I & III	MIL-DTL-5015 MS3400 Series	AS81703 Series III	MIL-C-26482 Series II					
08	8	8S	-	8	1/2-20 UNF	.82(20.8)	.690 (17.5)	.750 (19.1)	1.000 (25.4)
10	10	10S, 10SL	-	10	5/8-24 UNEF	.94(23.9)	.850 (21.5)	.780 (19.8)	1.020 (26.0)
12	12	12, 12S	7	12	3/4-20 UNEF	1.06(26.9)	.890 (22.5)	.810 (20.6)	1.040 (26.5)
14	14	14, 14S	12	14	7/8-20 UNEF	1.17(29.7)	1.000 (25.4)	.830 (21.1)	1.080 (27.5)
16	16	16, 16S	19	16	1-20 UNEF	1.29(32.8)	1.120 (28.5)	.860 (21.8)	1.100 ((28.0)
18	18	18	27	18	1 1/16-18 UNEF	1.42(36.1)	1.240 (31.5)	.880 (22.4)	1.120 (28.5)
20	20	20	37	20	1 3/16-18 UNEF	1.54(39.1)	1.380 (35.0)	.910 (23.1)	1.140 (29.0)
22	22	22	-	22	1 5/16-18 UNEF	1.66(42.2)	1.500 (38.0)	.930 (23.6)	1.180 (30.0)
24	24	24	-	24	1 7/16-18 UNEF	2.01(51.1)	1.610 (41.0)	.940 (23.9)	1.220 (31.0)

Table I: Dimensions (Continued)

Order No.	F Max	G Max	H ± .003 (.08)	J Thread Class 2 A	K ± .004 (.10)	Ferrule Quantity (See note 4)	
						Std.	Opt.
08	.880 (22.4)	1.140 (29.0)	.435 (11.0)	1/2-20 UNF	.315 (8.00)	1	-
10	.960 (24.4)	1.200 (30.5)	.623 (15.8)	5/8-24 UNEF	.531 (13.5)	2	-
12	1.000 (25.4)	1.260 (32.0)	.746 (18.9)	3/4-20 UNEF	.591 (15.0)	3	-
14	1.070 (27.2)	1.320 (33.5)	.871 (22.1)	7/8-20 UNEF	.709 (18.0)	5	-
16	1.130 (28.7)	1.380 (35.0)	.996 (25.3)	1-20 UNEF	.827 (21.0)	6	7
18	1.180 (30.0)	1.440 (36.5)	1.121 (28.5)	1 1/16-18 UNEF	.945 (24.0)	7	-
20	1.250 (31.8)	1.520 (38.5)	1.245 (31.6)	1 3/16-18 UNEF	1.063 (27.0)	9	11
22	1.310 (33.3)	1.570 (40.0)	1.371 (34.8)	1 5/16-18 UNEF	1.181 (30.0)	10	13
24	1.360 (34.5)	1.630 (41.5)	1.371 (34.8)	1 7/16-18 UNEF	1.299 (33.0)	12	17

Table II: Material and Finish Options

Code	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
ZRC	Aluminum; zinc nickel over electroless nickel (RoHS)
Z1	Stainless steel; passivate
ZM	Stainless steel; electroless nickel

Table III: Shrink Boot

Shell Size	Shrink Boot Part Number
09	770-001S1 04
11	770-001S1 06
13	770-001S1 06
15	770-001S1 07
17	770-001S1 07
19	770-001S1 08
21	770-001S1 08
23	770-001S1 08
25	770-001S1 09

Material/Finish

Backshell, elbows, coupling and gland nut, compression ring and star	Aluminum alloy or CRES/Table II
Tinel ring	Nickel-titanium alloy/n.a.
Band	CRES/passivate

Notes:

1. Assembly identified with manufacturer's name, part number and date code, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 Series Backshell Assembly Tools are recommended for assembly and installation.
4. Star not supplied with order number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule quantity per Table I is selected, one split and one solid star will be supplied.
5. Self-locking functionality, eliminates lock-wire requirements.
6. Ferrule kit sold separately.
687-764 ferrule and HST device kit
687-809 ferrule and sealing device kit
687-748 solder ferrule
687-841-01 HST flex device

Dimensions in inches (millimeters) and are subject to change without notice.



470-013 StarShield™ EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series I and II Connectors



**Non
Environmental**



**Self
Nestor**



**Rear End
Options**

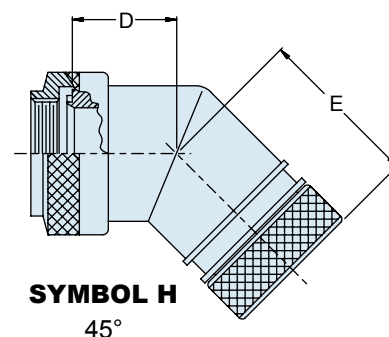
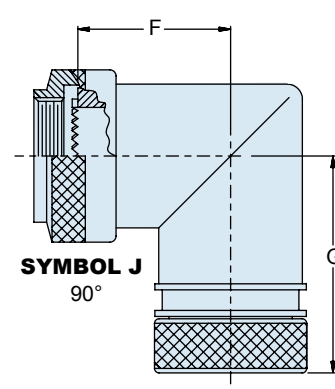
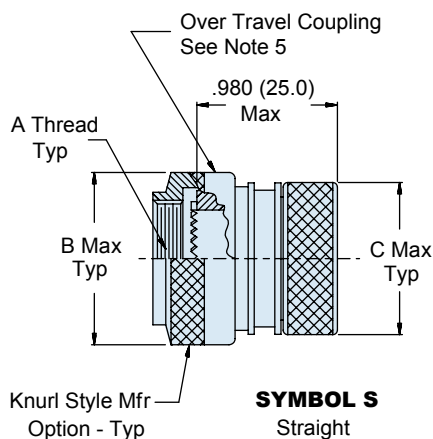
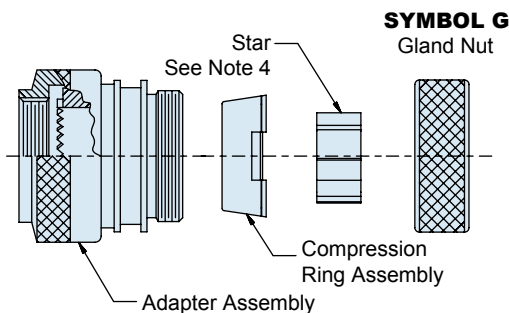
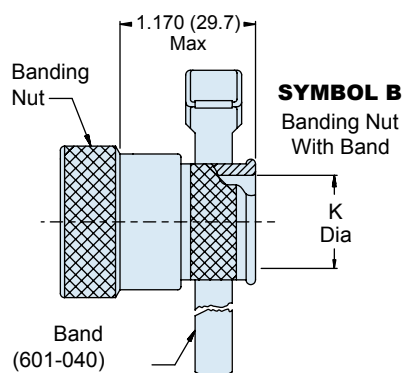
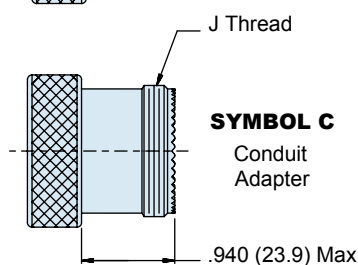
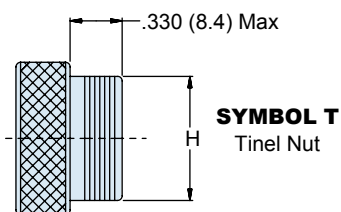
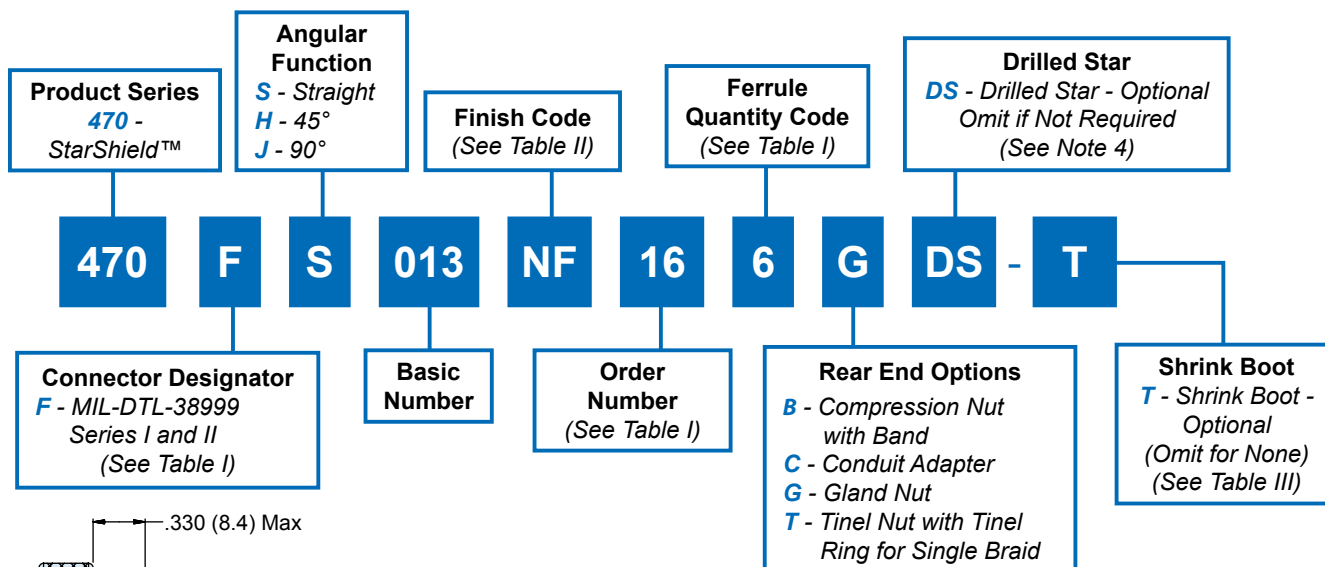


**Standard
Length**



**High
Ferrule Count**

StarShield™ non-environmental, high ferrule count backshell with self-nestor coupling



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470-013 StarShield™ EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series I and II Connectors



StarShield™
Backshells

Table I: Dimensions

Order No.	Connector Shell Size		A Thread Class 2 B	B Dia Max	C Dia Max	D Max
	MIL-DTL-38999 Series II	MIL-DTL-38999 Series I				
08	8	09	7/16-28 UNEF	.750 (19.0)	.690 (17.5)	.490 (12.5)
10	10	11	9/16-24 UNEF	.870 (22.0)	.850 (21.5)	.510 (13.0)
12	12	13	11/16-24 UNEF	1.000 (25.4)	.890 (22.5)	.550 (14.0)
14	14	15	13/16-20 UNEF	1.120 (30.5)	1.000 (25.4)	.570 (14.5)
16	16	17	15/16-20 UNEF	1.320 (33.5)	1.120 (28.5)	.590 (15.0)
18	18	19	1 1/16-18 UNEF	1.460 (37.0)	1.240 (31.5)	.610 (15.5)
20	20	21	1 3/16-18 UNEF	1.520 (38.5)	1.380 (35.0)	.650 (16.5)
22	22	23	1 5/16-18 UNEF	1.650 (42.0)	1.500 (38.0)	.670 (17.0)
24	24	25	1 7/16-18 UNEF	1.830 (46.5)	1.610 (41.0)	.710 (18.0)

Table I: Dimensions (Continued)

Order No.	E Max	F Max	G Max	H ± .003 (.08)	J Thread Class 2 A	K ± .004 (.10)	Ferrule Quantity (See Note 4)	
							Std.	Opt.
08	1.000 (25.4)	.630 (16.0)	1.140 (29.0)	.435 (11.0)	7/16-28 UNEF	.315 (8.00)	1	-
10	1.020 (26.0)	.690 (17.5)	1.200 (30.5)	.623 (15.8)	9/16-24 UNEF	.531 (13.5)	2	-
12	1.040 (26.5)	.750 (19.0)	1.260 (32.0)	.746 (18.9)	11/16-20 UNEF	.591 (15.0)	3	-
14	1.080 (27.5)	.810 (20.5)	1.320 (33.5)	.871 (22.1)	13/16-24 UNEF	.709 (18.0)	5	-
16	1.100 (28.0)	.870 (22.0)	1.380 (35.0)	.996 (25.3)	15/16-20 UNEF	.827 (21.0)	6	7
18	1.120 (28.5)	.930 (23.5)	1.440 (36.5)	1.121 (28.5)	1 1/16-18 UNEF	.945 (24.0)	7	-
20	1.140 (29.0)	1.000 (25.4)	1.520 (38.5)	1.245 (31.6)	1 3/16-18 UNEF	1.063 (27.0)	9	11
22	1.180 (30.0)	1.060 (27.0)	1.570 (40.0)	1.371 (34.8)	1 5/16-18 UNEF	1.181 (30.0)	10	13
24	1.220 (31.0)	1.120 (28.5)	1.630 (41.5)	1.371 (34.8)	1 7/16-18 UNEF	1.299 (33.0)	12	17

Table II: Material and Finish Options

Code	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
ZRC	Aluminum; zinc nickel over electroless nickel (RoHS)
Z1	Stainless steel; passivate
ZM	Stainless steel; electroless nickel

Table III: Shrink Boot

Shell Size	Shrink Boot Part Number
09	770-001S1 04
11	770-001S1 06
13	770-001S1 06
15	770-001S1 07
17	770-001S1 07
19	770-001S1 08
21	770-001S1 08
23	770-001S1 08
25	770-001S1 09

Notes:

1. Assembly identified with manufacturer's name, part number and date code, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 Series Backshell Assembly Tools are recommended for assembly and installation.
4. Star not supplied with Order Number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule quantity per Table I is selected, one split and one solid star will be supplied.
5. Over-travel coupling design provides self-seating and self-locking functionality, eliminating lock-wire requirements.
6. Ferrule kit sold separately.
687-764 ferrule and HST device kit
687-809 ferrule and sealing device kit
687-748 solder ferrule
687-841-01 HST flex device

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470-015 StarShield™ EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series I and II Connectors



**Non
Environmental**



**Self
Locking**



**Rear End
Options**



**Standard
Length**



**High
Ferrule Count**

StarShield™ non-environmental, standard length backshell with self-locking coupling

Product Series

**470 -
StarShield™**

Angular Function

**S - Straight
H - 45°
J - 90°**

Finish Code (See Table II)

015

Ferrule Quantity Code (See Table I)

16

Drilled Star

**DS - Drilled Star -
Optional
(Omit if Not Required)
(See Note 4)**

G

DS

T

Connector Designator

**H - MIL-DTL-38999
Series 1 and II**

Basic Number

015

Order Number (See Table I)

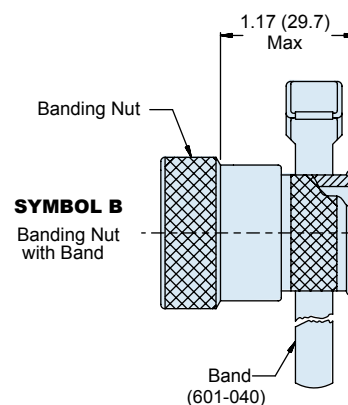
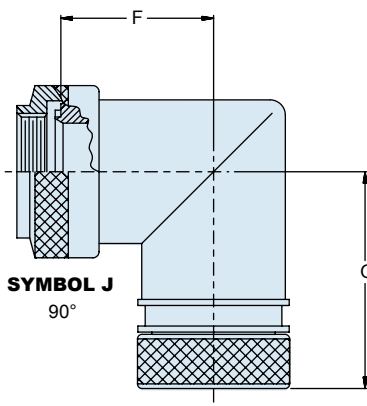
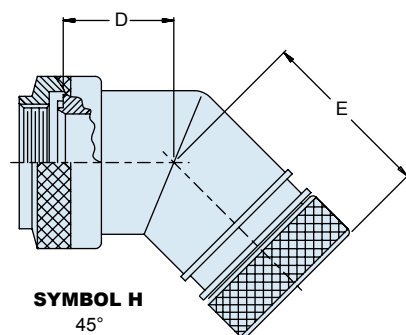
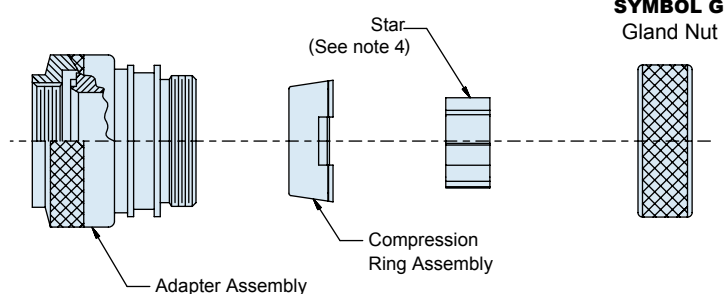
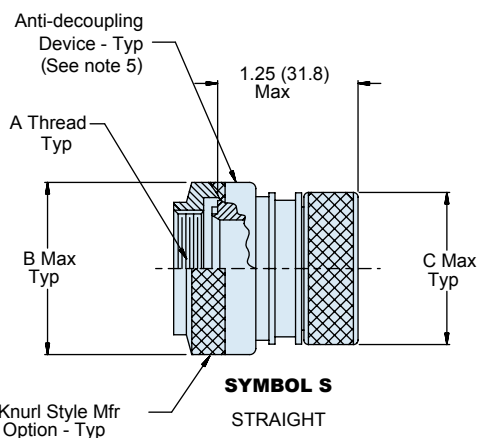
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Rear End Options

**B - Compression Nut
with Band
C - Conduit Adapter
G - Gland Nut
T - Tinel Nut with Tinel
Ring for Single Braid**

Shrink Boot

**T - Shrink Boot -
Optional
(Omit for None)
(See Table III)**



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470-015

StarShield™ EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series I and II Connectors



StarShield™
Backshells

Table I : Dimensions

Order No	Connector Shell Size		A Thread Class 2 B	B DIA MAX	C Dia Max	D Max	E Max	F Max
	MIL-DTL-38999 Series II	MIL-DTL-38999 Series I						
08	08	09	7/16-28 UNEF	.69(17.5)	.690 (17.5)	.750 (19.1)	1.000 (25.4)	.880 (22.4)
10	10	11	9/16-24 UNEF	.81(20.6)	.850 (21.5)	.780 (19.8)	1.020 (26.0)	.960 (24.4)
12	12	13	11/16-24 UNEF	.94(23.9)	.890 (22.5)	.810 (20.6)	1.040 (26.5)	1.000 (25.4)
14	14	15	13/16-20 UNEF	1.06(26.9)	1.000 (25.4)	.830 (21.1)	1.080 (27.5)	1.070 (27.2)
16	16	17	15/16-20 UNEF	1.17(29.7)	1.120 (28.5)	.860 (21.8)	1.100 ((28.0)	1.130 (28.7)
18	18	19	1 1/16-18 UNEF	1.29(32.8)	1.240 (31.5)	.880 (22.4)	1.120 (28.5)	1.180 (30.0)
20	20	21	1 3/16-18 UNEF	1.41(35.8)	1.380 (35.0)	.910 (23.1)	1.140 (29.0)	1.250 (31.8)
22	22	23	1 5/16-18 UNEF	1.54(39.1)	1.500 (38.0)	.930 (23.6)	1.180 (30.0)	1.310 (33.3)
24	24	25	1 7/16-18 UNEF	1.66(42.2)	1.610 (41.0)	.940 (23.9)	1.220 (31.0)	1.360 (34.5)

Table I: (Continued)

Order No.	G Max	H ± .003 (.08)	J Thread ISO Metric	K ± .004 (.10)	Ferrule Quantity (See Note 4)	
					Std.	Opt.
09	1.140 (29.0)	.435 (11.0)	M12 X 1 - 6g	.315 (8.00)	1	-
11	1.200 (30.5)	.623 (15.8)	M15 X 1 - 6g	.531 (13.5)	2	-
13	1.260 (32.0)	.746 (18.9)	M18 X 1 - 6g	.591 (15.0)	3	-
15	1.320 (33.5)	.871 (22.1)	M22 X 1 - 6g	.709 (18.0)	5	-
17	1.380 (35.0)	.996 (25.3)	M25 X 1 - 6g	.827 (21.0)	6	7
19	1.440 (36.5)	1.121 (28.5)	M28 X 1 - 6g	.945 (24.0)	7	-
21	1.520 (38.5)	1.245 (31.6)	M31 X 1 - 6g	1.063 (27.0)	9	11
23	1.570 (40.0)	1.371 (34.8)	M34 X 1 - 6g	1.181 (30.0)	10	13
25	1.630 (41.5)	1.371 (34.8)	M37 X 1 - 6g	1.299 (33.0)	12	17

Table II: Material and Finish Options

Code	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
ZRC	Aluminum; zinc nickel over electroless nickel (RoHS)
Z1	Stainless steel; passivate
ZM	Stainless steel; electroless nickel

Material/Finish

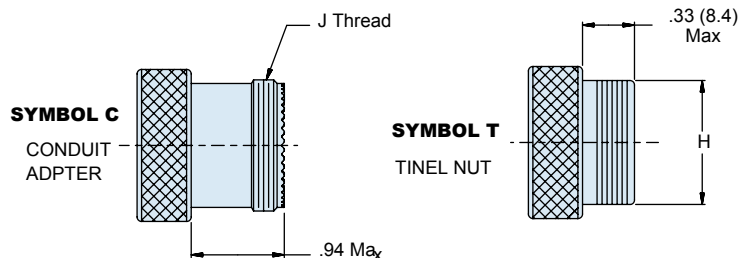
Backshell, elbows, coupling and gland nut, compression ring and star	Aluminum alloy or CRES/Table II
Anti-decoupling device	Corrosion resistant material
O-ring	Silicone/n.a.
Tinel ring	Nickel-titanium alloy/n.a.
Band	CRES/passivate

Table III: Shrink Boot

Shell Size	Shrink Boot Part Number
09	770-001S1 04
11	770-001S1 06
13	770-001S1 06
15	770-001S1 07
17	770-001S1 07
19	770-001S1 08
21	770-001S1 08
23	770-001S1 08
25	770-001S1 09

Notes:

1. Assembly identified with manufacturer's name, part number and date code, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 Series Backshell Assembly Tools are recommended for assembly and installation.
4. Star not supplied with order number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule quantity per Table I is selected, one split and one solid star will be supplied.
5. Self-locking functionality, eliminates lock-wire requirements.
6. Ferrule kit sold separately.
687-764 ferrule and HST device kit
687-809 ferrule and sealing device kit
687-748 solder ferrule
687-841-01 HST flex device



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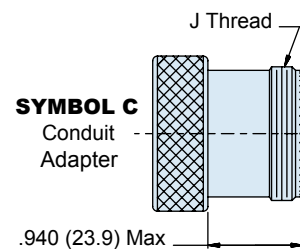
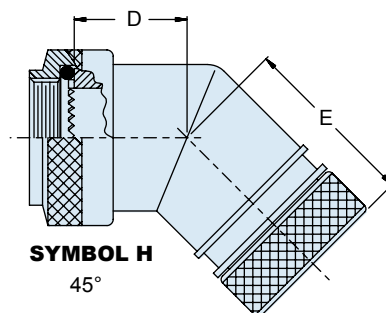
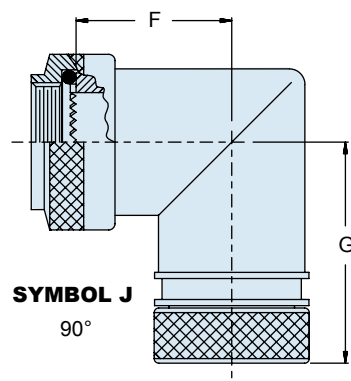
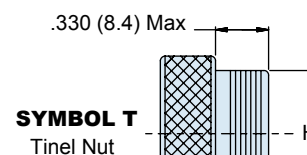
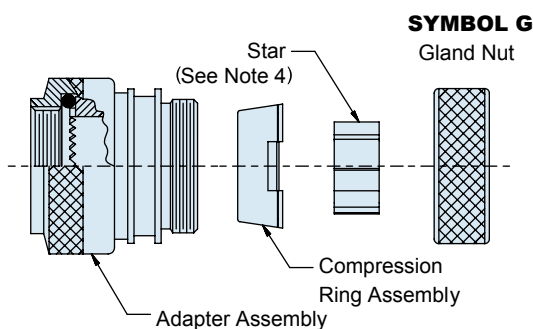
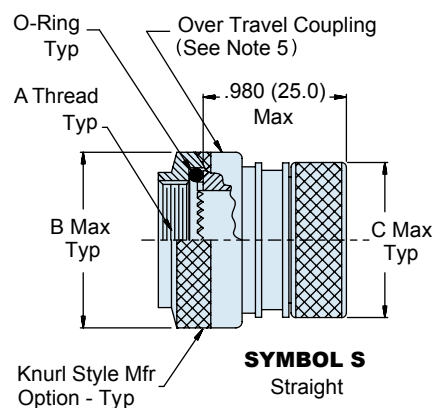
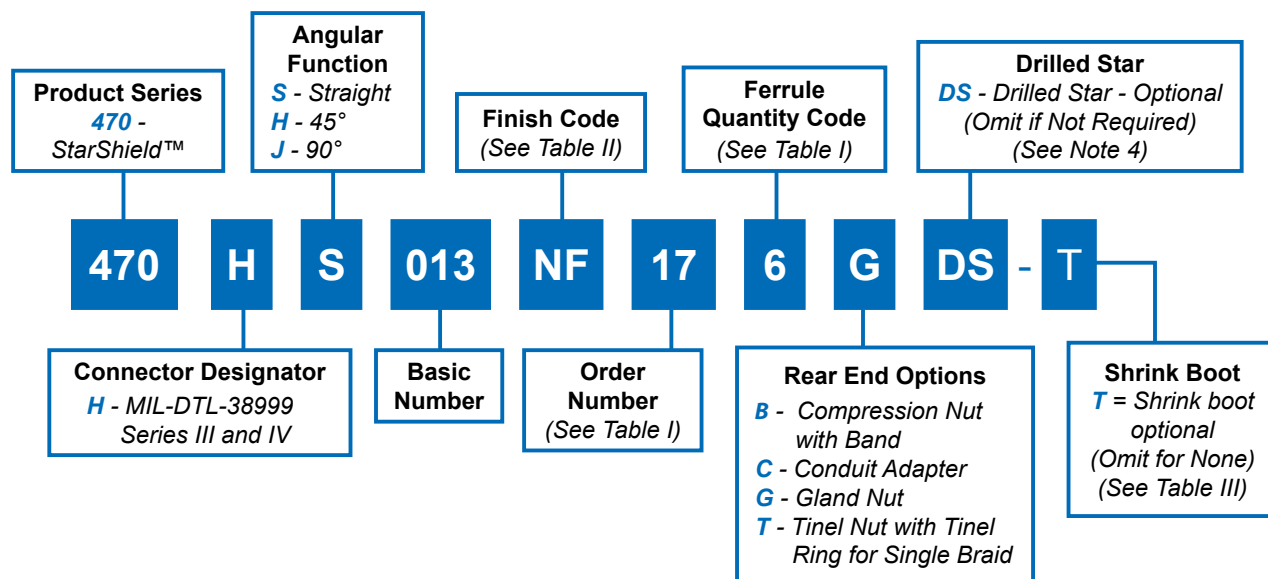
470-013 StarShield™ EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series III and IV Connectors



Environmental

Self
NestorRear End
OptionsStandard
LengthHigh
Ferrule Count

StarShield™ environmental backshell with self-nestor coupling and rear end options



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470-013 StarShield™ EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series III and IV Connectors



StarShield™
Backshells

Table I: Dimensions							
Order No.	Connector Shell Size Ref	A Thread ISO Metric	B Dia Max	C Dia Max	D Max	E Max	F Max
09	A/9	M12 X 1 - 6H	.75 (19.0)	.690 (17.5)	.490 (12.5)	1.000 (25.4)	.630 (16.0)
11	B/11	M15 X 1 - 6H	.870 (22.0)	.850 (21.5)	.510 (13.0)	1.020 (26.0)	.690 (17.5)
13	C/13	M18 X 1 - 6H	1.000 (25.4)	.890 (22.5)	.550 (14.0)	1.040 (26.5)	.750 (19.0)
15	D/15	M22 X 1 - 6H	1.200 (30.5)	1.000 (25.4)	.570 (14.5)	1.080 (27.5)	.810 (20.5)
17	E/17	M25 X 1 - 6H	1.320 (33.5)	1.120 (28.5)	.590 (15.0)	1.100 ((28.0)	.870 (22.0)
19	F/19	M28 X 1 - 6H	1.460 (37.0)	1.240 (31.5)	.610 (15.5)	1.120 (28.5)	.930 (23.5)
21	G/21	M31 X 1 - 6H	1.520 (38.5)	1.380 (35.0)	.650 (16.5)	1.140 (29.0)	1.000 (25.4)
23	H/23	M34 X 1 - 6H	1.650 (42.0)	1.500 (38.0)	.670 (17.0)	1.180 (30.0)	1.060 (27.0)
25	J/25	M37 X 1 - 6H	1.830 (46.5)	1.610 (41.0)	.710 (18.0)	1.220 (31.0)	1.120 (28.5)

Table I: Dimensions (Continued)						
Order No.	G Max	H ± .003 (.08)	J Thread ISO Metric	K ± .004 (.10)	Ferrule Quantity (See Note 4)	
					Std.	Opt.
09	1.140 (29.0)	.435 (11.0)	M12 X 1 - 6g	.315 (8.00)	1	-
11	1.200 (30.5)	.623 (15.8)	M15 X 1 - 6g	.531 (13.5)	2	-
13	1.260 (32.0)	.746 (18.9)	M18 X 1 - 6g	.591 (15.0)	3	-
15	1.320 (33.5)	.871 (22.1)	M22 X 1 - 6g	.709 (18.0)	5	-
17	1.380 (35.0)	.996 (25.3)	M25 X 1 - 6g	.827 (21.0)	6	7
19	1.440 (36.5)	1.121 (28.5)	M28 X 1 - 6g	.945 (24.0)	7	-
21	1.520 (38.5)	1.245 (31.6)	M31 X 1 - 6g	1.063 (27.0)	9	11
23	1.570 (40.0)	1.371 (34.8)	M34 X 1 - 6g	1.181 (30.0)	10	13
25	1.630 (41.5)	1.371 (34.8)	M37 X 1 - 6g	1.299 (33.0)	12	17

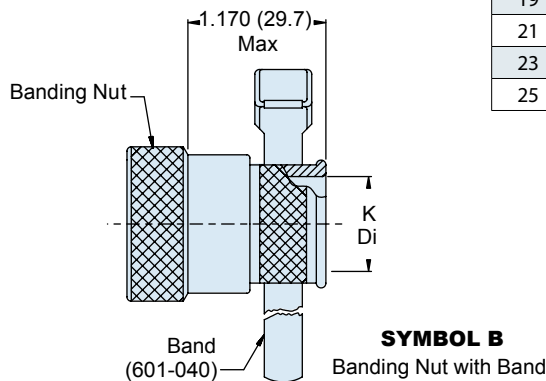
Table II: Material and Finish Options	
Code	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
ZRC	Aluminum; zinc nickel over electroless nickel (RoHS)
Z1	Stainless steel; passivate
ZM	Stainless steel; electroless nickel

Material/Finish	
Backshell, elbows, coupling and gland nut, compression ring and star	Aluminum alloy or CRES/Table II
Tinel ring	Nickel-titanium alloy/n.a.
Band	CRES/Passivate
O-ring	Silicone/n.a.

Table III: Shrink Boot	
Shell Size	Shrink Boot Part Number
09	770-001S1 04
11	770-001S1 06
13	770-001S1 06
15	770-001S1 07
17	770-001S1 07
19	770-001S1 08
21	770-001S1 08
23	770-001S1 08
25	770-001S1 09

Notes:

1. Assembly identified with manufacturer's name, part number and date code, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 Series Backshell Assembly Tools are recommended for assembly and installation.
4. Star not supplied with Order Number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule quantity per Table I is selected, one split and one solid star will be supplied.
5. Over-travel coupling design provides self-seating and self-locking functionality, eliminating lock-wire requirements.
6. Ferrule kit sold separately.
687-764 ferrule and HST device kit
687-809 ferrule and sealing device kit
687-748 solder ferrule
687-841-01 HST flex device



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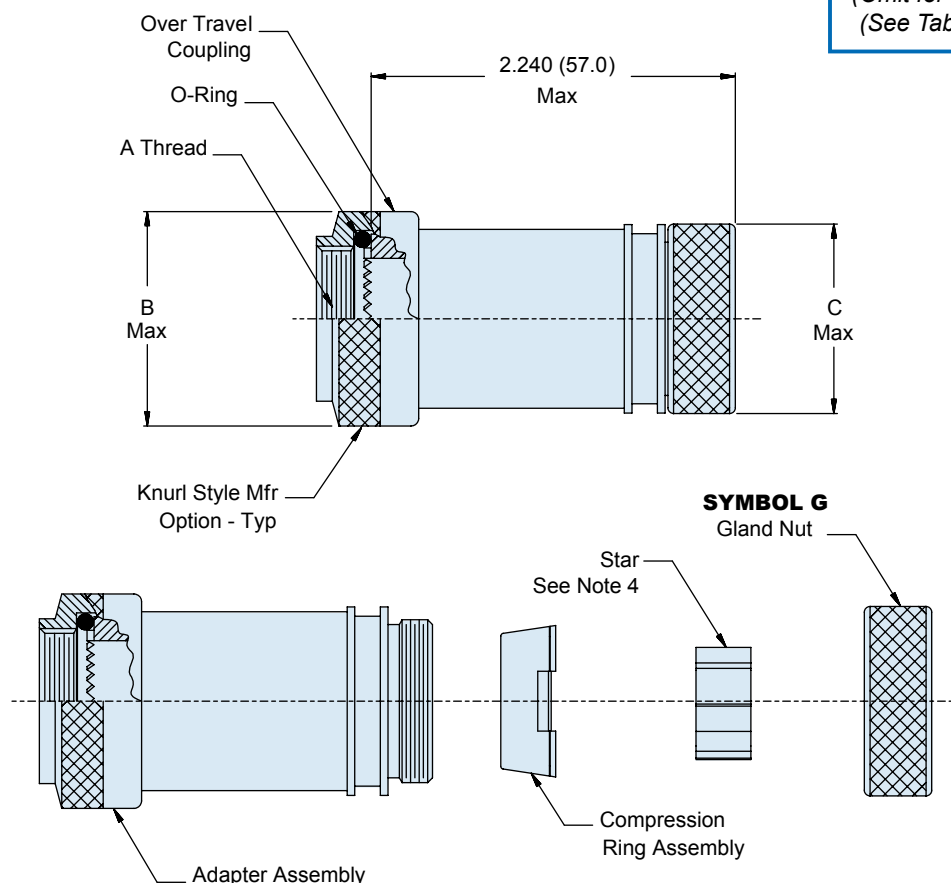
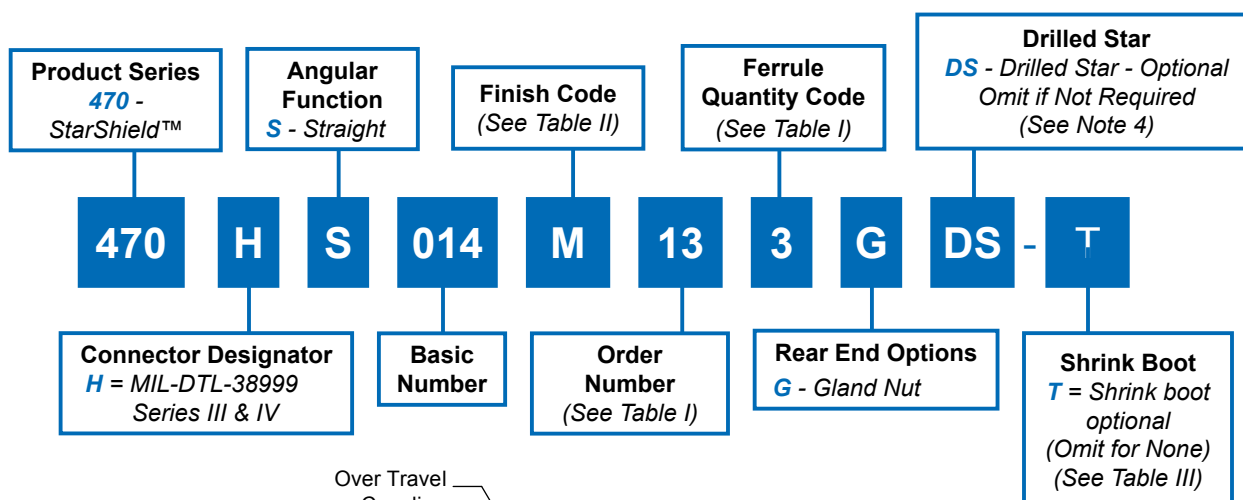
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470-014 StarShield™ Extended Length EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series III and IV Connectors



StarShield™ environmental, high ferrule count backshell with self-nestor



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470-014
StarShield™ Extended EMI/RFI
Shield Termination Backshell
for MIL-DTL-38999 Series III and IV Connectors



Table I: Dimensions

Order No.	Connector Shell Size Ref	A Thread ISO Metric	B Dia Max	C Dia Max	Ferrule Quantity (See Note 4)	
					Std.	Opt.
09	A/9	M12 X 1 - 6H	.750 (19.0)	.690 (17.5)	1	-
11	B/11	M15 X 1 - 6H	.870 (22.0)	.850 (21.5)	2	-
13	C/13	M18 X 1 - 6H	1.000 (25.4)	.890 (22.5)	3	-
15	D/15	M22 X 1 - 6H	1.120 (30.5)	1.000 (25.4)	5	-
17	E/17	M25 X 1 - 6H	1.320 (33.5)	1.120 (28.5)	6	7
19	F/19	M28 X 1 - 6H	1.460 (37.0)	1.240 (31.5)	7	-
21	G/21	M31 X 1 - 6H	1.520 (38.5)	1.380 (35.0)	9	11
23	H/23	M34 X 1 - 6H	1.650 (42.0)	1.500 (38.0)	10	13
25	J/25	M37 X 1 - 6H	1.830 (46.5)	1.610 (41.0)	12	17

Table II: Material and Finish Options

Code	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
ZRC	Aluminum; zinc nickel over electroless nickel (RoHS)
Z1	Stainless steel; passivate
ZM	Stainless steel; electroless nickel

Material/Finish

Backshell, gland nut, compression ring and star	Aluminum alloy or CRES/Table II
O-ring	Silicone/n.a.
Coupling Nut	Stainless steel passivate

Notes:

1. Assembly identified with manufacturer's name, part number and date code, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 Series Backshell Assembly Tools are recommended for assembly and installation.
4. Star not supplied with Order Number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule quantity per Table I is selected, one split and one solid star will be supplied.
5. Ferrule kit sold separately.
687-764 ferrule and HST device kit
687-809 ferrule and sealing device kit
687-748 solder ferrule
687-841-01 HST flex device

Table III: Shrink Boot

Shell Size	Shrink Boot Part Number
09	770-001S1 04
11	770-001S1 06
13	770-001S1 06
15	770-001S1 07
17	770-001S1 07
19	770-001S1 08
21	770-001S1 08
23	770-001S1 08
25	770-001S1 09

Dimensions in inches (millimeters) and are subject to change without notice.



470-015 StarShield™ EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series III and IV Connectors



Environmental

Rear End
OptionsSelf
LockingStandard
LengthHigh
Ferrule Count

StarShield™ environmental, backshell with self-locking coupling nut and shrink boot

Product Series
470 -
StarShield™

470

**Angular
Function**

S - Straight
H - 45°
J - 90°

H**S**

Finish Code
(See Table II)

015

**Ferrule
Quantity Code**
(See Table I)

17

Drilled Star
DS - Drilled Star -
Optional
(Omit if Not Required)
(See Note 4)

6**G****DS****-****T**

Connector Designator
H - MIL-DTL-38999
Series III and IV

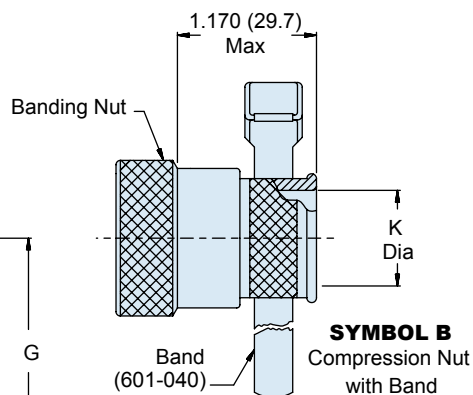
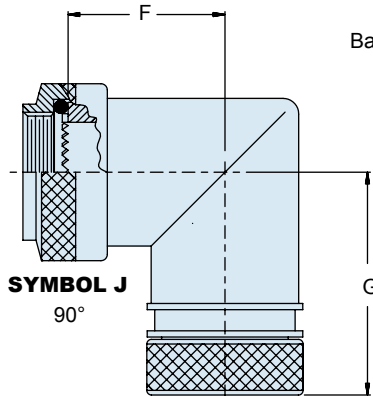
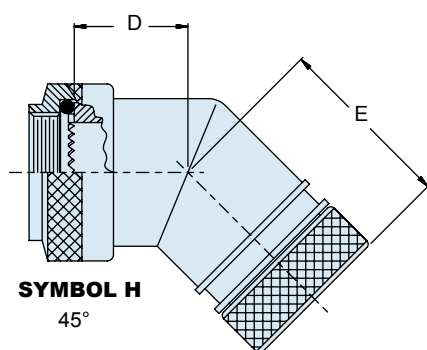
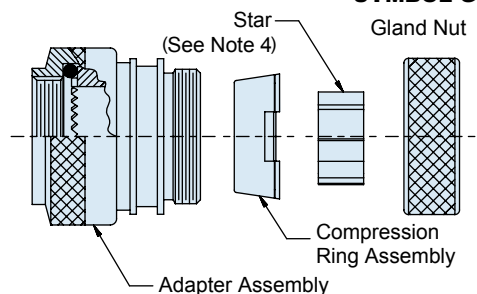
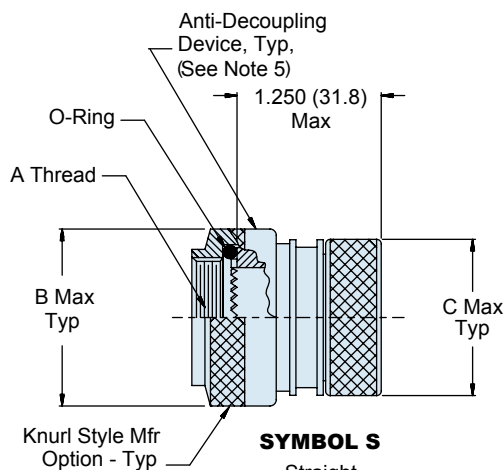
**Basic
Number**

**Order
Number**
(See Table I)

Rear End Options

B - Compression Nut
with Band
C - Conduit Adapter
G - Gland Nut
T - Tinel Nut with Tinel
Ring for Single Braid

Shrink Boot
T - Shrink Boot -
Optional
(Omit for None)
(See Table III)



Dimensions in inches (millimeters) and are subject to change without notice.

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470-015

StarShield™ EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series III and IV Connectors



Table I: Dimensions							
Order No.	Connector Shell Size Ref	A Thread ISO Metric	B Dia Max	C Dia Max	D Max	E Max	F Max
09	A/9	M12 X 1 - 6H	.940 (23.9)	.690 (17.5)	.750 (19.1)	1.000 (25.4)	.880 (22.4)
11	B/11	M15 X 1 - 6H	1.060 (26.9)	.850 (21.5)	.780 (19.8)	1.020 (26.0)	.960 (24.4)
13	C/13	M18 X 1 - 6H	1.170 (29.7)	.890 (22.5)	.810 (20.6)	1.040 (26.5)	1.000 (25.4)
15	D/15	M22 X 1 - 6H	1.290 (32.8)	1.000 (25.4)	.830 (21.1)	1.080 (27.5)	1.070 (27.2)
17	E/17	M25 X 1 - 6H	1.420 (36.1)	1.120 (28.5)	.860 (21.8)	1.100 (28.0)	1.130 (28.7)
19	F/19	M28 X 1 - 6H	1.540 (39.1)	1.240 (31.5)	.880 (22.4)	1.120 (28.5)	1.180 (30.0)
21	G/21	M31 X 1 - 6H	1.670 (42.4)	1.380 (35.0)	.910 (23.1)	1.140 (29.0)	1.250 (31.8)
23	H/23	M34 X 1 - 6H	2.010 (51.1)	1.500 (38.0)	.930 (23.6)	1.180 (30.0)	1.310 (33.3)
25	J/25	M37 X 1 - 6H	2.120 (53.8)	1.610 (41.0)	.940 (23.9)	1.220 (31.0)	1.360 (34.5)

Table I: Dimensions (Continued)						
Order No.	G Max	H ±.003 (.08)	J Thread ISO Metric	K ±.004 (.10)	Ferrule Quantity (See Note 4)	
					Std.	Opt.
09	1.140 (29.0)	.435 (11.0)	M12 X 1 - 6g	.315 (8.00)	1	-
11	1.200 (30.5)	.623 (15.8)	M15 X 1 - 6g	.531 (13.5)	2	-
13	1.260 (32.0)	.746 (18.9)	M18 X 1 - 6g	.591 (15.0)	3	-
15	1.320 (33.5)	.871 (22.1)	M22 X 1 - 6g	.709 (18.0)	5	-
17	1.380 (35.0)	.996 (25.3)	M25 X 1 - 6g	.827 (21.0)	6	7
19	1.440 (36.5)	1.121 (28.5)	M28 X 1 - 6g	.945 (24.0)	7	-
21	1.520 (38.5)	1.245 (31.6)	M31 X 1 - 6g	1.063 (27.0)	9	11
23	1.570 (40.0)	1.371 (34.8)	M34 X 1 - 6g	1.181 (30.0)	10	13
25	1.630 (41.5)	1.371 (34.8)	M37 X 1 - 6g	1.299 (33.0)	12	17

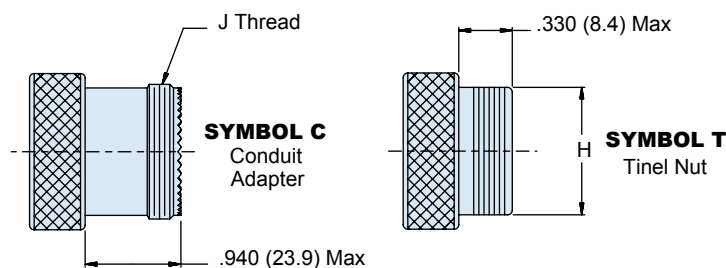
Table II: Material and Finish Options	
Code	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
ZRC	Aluminum; zinc nickel over electroless nickel (RoHS)
Z1	Stainless steel; passivate
ZM	Stainless steel; electroless nickel

Table III: Shrink Boot	
Shell Size	Shrink Boot Part Number
09	770-001S1 04
11	770-001S1 06
13	770-001S1 06
15	770-001S1 07
17	770-001S1 07
19	770-001S1 08
21	770-001S1 08
23	770-001S1 08
25	770-001S1 09

Material/Finish	
Backshell, elbows, coupling and gland nut, compression ring and star	Aluminum alloy or CRES/Table II
Anti-decoupling device	Corrosion resistant material
Tinel ring	Nickel-titanium alloy/n.a.
Band	CRES/passivate

Notes:

1. Assembly identified with manufacturer's name, part number and date code, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 Series Backshell Assembly Tools are recommended for assembly and installation.
4. Star not supplied with order number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule quantity per Table I is selected, one split and one solid star will be supplied.
5. Over-travel coupling design provides self-seating and self-locking functionality, eliminating lock-wire requirements.
6. Ferrule kit sold separately.
687-764 ferrule and HST device kit
687-809 ferrule and sealing device kit
687-748 solder ferrule
687-841-01 HST flex device



Dimensions in inches (millimeters) and are subject to change without notice.



470-017 StarShield™ EMI/RFI Composite Backshell for MIL-DTL-38999 Series III and IV Connectors



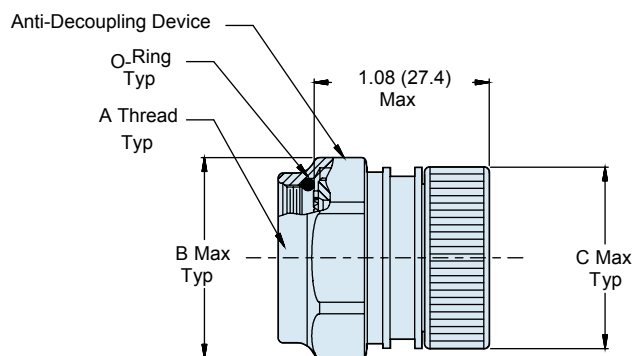
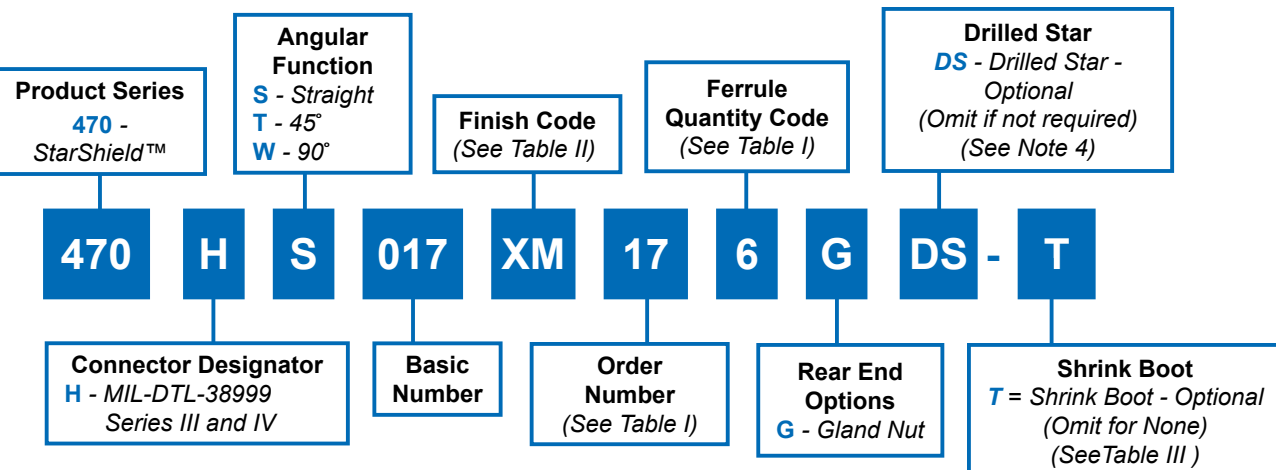
Environmental

Standard
Length

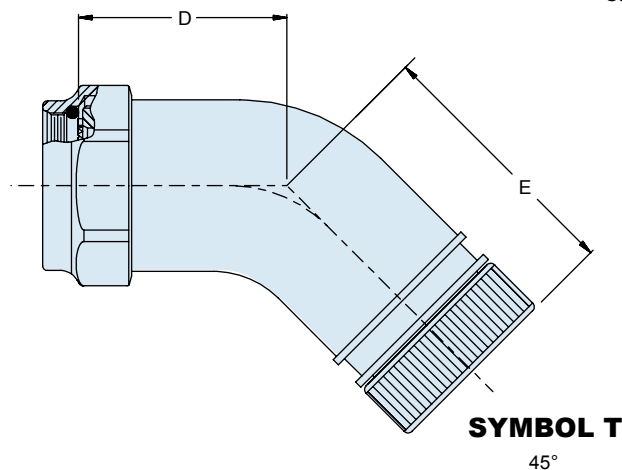
Composite

Self
LockingHigh
Ferrule Count

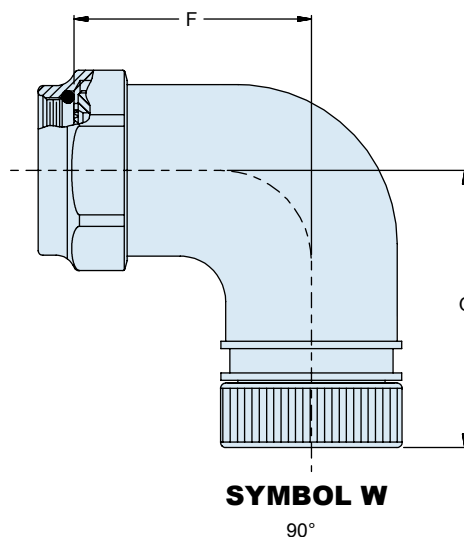
StarShield™ composite backshell with self-locking coupling and shrink boot

**SYMBOL S**

Straight

**SYMBOL T**

45°

**SYMBOL W**

90°

470-017

StarShield™ EMI/RFI Composite Backshell for MIL-DTL-38999 Series III and IV Connectors



Table I: Dimensions

Order Number	Connector Shell Size Reference	A Thread ISO Metric	B Dia Max	C Dia Max	D Max	E Max	F Max	G Max	Ferrule Quantity (See Note 4)	
									Std.	Opt.
09	A/9	M12 X 1 - 6H	.83 (21.1)	.681 (17.30)	0.75	1.09	0.72	1.20	1	-
11	B/11	M15 X 1 - 6H	.96 (24.4)	.885 (22.48)	0.78	1.12	0.78	1.26	2	-
13	C/13	M18 X 1 - 6H	1.09 (27.7)	.917 (23.29)	0.78	1.14	0.85	1.32	3	-
15	D/15	M22 X 1 - 6H	1.22 (31.0)	1.055 (26.80)	0.78	1.17	0.91	1.39	5	-
17	E/17	M25 X 1 - 6H	1.35 (34.3)	1.173 (29.79)	0.81	1.20	0.97	1.45	6	7
19	F/19	M28 X 1 - 6H	1.48 (37.6)	1.291 (32.79)	0.82	1.21	1.03	1.51	7	-
21	G/21	M31 X 1 - 6H	1.62 (41.1)	1.409 (37.79)	0.85	1.23	1.10	1.57	9	11
23	H/23	M34 X 1 - 6H	1.75 (44.5)	1.527 (38.79)	0.89	1.27	1.16	1.64	10	13
25	J/25	M37 X 1 - 6H	1.89 (48.0)	1.665 (42.29)	0.92	1.30	1.22	1.70	12	17

Table II: Material and Finish Options

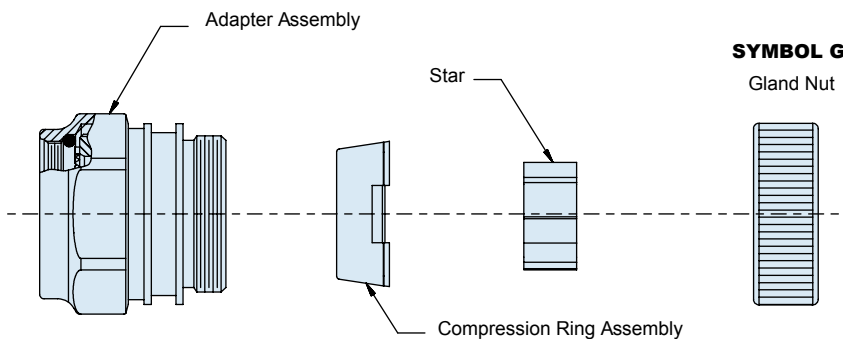
Code	Finish Description
XM	Electroless nickel
XW	Cadmium, olive drab
XZR	Zinc nickel, Black

Table III: Shrink Boot

Shell Size	Shrink Boot Ref. Part No.
09	770-001S1 04
11	770-001S1 06
13	770-001S1 06
15	770-001S1 07
17	770-001S1 07
19	770-001S1 08
21	770-001S1 08
23	770-001S1 08
25	770-001S1 09

Material/Finish:

Backshell, compression ring and star	High grade engineering thermoplastic/ see Table III
Nuts	High grade engineering thermoplastic/ color black
O-ring	Silicone/n.a.



SYMBOL G
Gland Nut

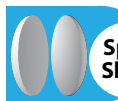
1. Assembly identified with manufacturer's name and P/N, space permitting.
2. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
3. Ferrule kit sold separately.
687-764 ferrule and HST device kit
687-809 ferrule and sealing device kit
687-748 solder ferrule
687-841-01 HST flex device
4. Star not supplied with order number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule qty per Table 1 is selected, one split and one solid star will be supplied

Dimensions in inches (millimeters) and are subject to change without notice.



470-019

StarShield™ EMI/RFI Split Termination Backshell for MIL-DTL-38999 Series III and IV Connectors

Non
EnvironmentalStandard
LengthHigh
Ferrule CountSplit
ShellSelf
Locking

StarShield™ split shell, high ferrule count backshell with self-locking coupling

Product Series
470 -
StarShield™

**Angular
Function**
E - 90°
F - 45°
S - Straight

Finish Code
(See Table II)

Dash Number
(See Table III)

Drilled Star
DS - Drilled Star - Optional
(Omit if Not Required)
(See Note 4)

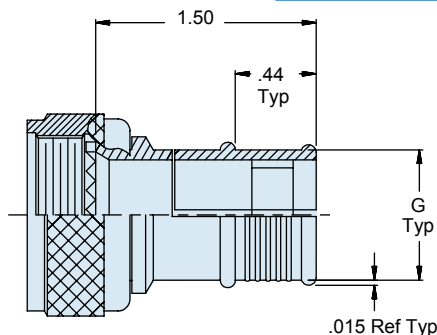
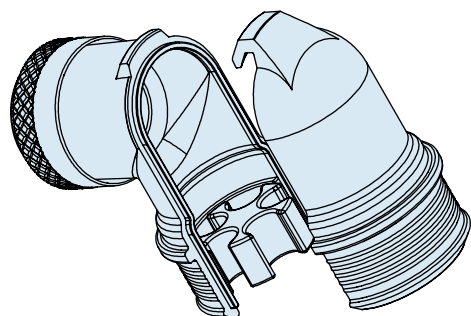
470**H****E****019****NF****19****24 -****12****DS**

Connector Designator
H - MIL-DTL-38999
Series III and IV

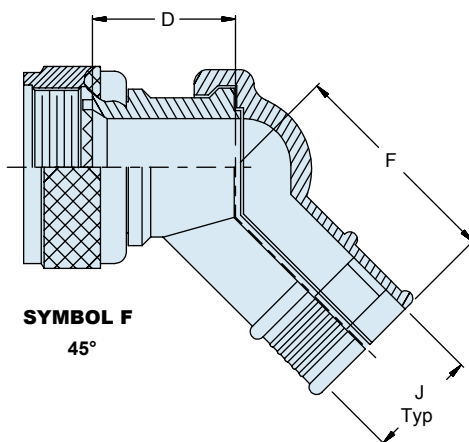
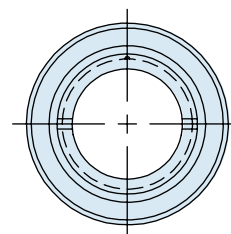
**Basic
Number**

Shell Size
(See Table I)

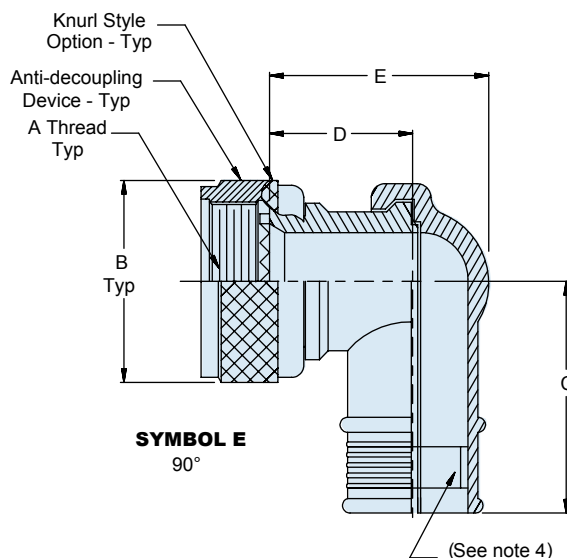
**Ferrule
Quantity**
(See Table III)



SYMBOL S
Straight



SYMBOL F
45°



SYMBOL E
90°

Dimensions in inches (millimeters) and are subject to change without notice.

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470-019
StarShield™ EMI/RFI Split Termination Backshell
for MIL-DTL-38999 Series III and IV Connectors



Table I: Dimensions							
Shell Size	A Thread ISO Metric	B Max	C Max	D Max	E Max	F Max	Max Entry
09	M12 X 1.0 - 6H	.940 (23.9)	1.995 (50.7)	1.030 (26.2)	1.339 (34.0)	1.405 (35.7)	14
11	M15 X 1.0 - 6H	1.060 (26.9)	2.055 (52.2)	1.100 (27.9)	1.465 (37.2)	1.435 (36.4)	14
13	M18 X 1.0 - 6H	1.170 (29.7)	2.125 (54.0)	1.160 (29.5)	1.589 (40.4)	1.465 (37.2)	18
15	M22 X 1.0 - 6H	1.290 (32.8)	2.185 (55.5)	1.220 (31.0)	1.715 (43.6)	1.485 (37.7)	24
17	M25 X 1.0 - 6H	1.420 (36.1)	2.245 (57.0)	1.310 (33.3)	1.901 (48.3)	1.515 (38.5)	24
19	M28 X 1.0 - 6H	1.540 (39.1)	2.265 (57.5)	1.370 (34.8)	2.025 (51.4)	1.535 (39.0)	24
21	M31 X 1.0 - 6H	1.670 (42.4)	2.405 (61.1)	1.370 (34.8)	2.025 (51.4)	1.565 (39.8)	28
23	M34 X 1.0 - 6H	2.010 (51.1)	2.435 (61.8)	1.440 (36.6)	2.152 (54.7)	1.595 (40.5)	28
25	M37 X 1.0 - 6H	2.120 (53.8)	2.495 (63.4)	1.560 (39.6)	2.403 (61.0)	1.615 (41.0)	32

Table II: Material and Finish Options	
Code	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
ZRC	Aluminum; zinc nickel over electroless nickel (RoHS)
Z1	Stainless steel; passivate
ZM	Stainless steel; electroless nickel

Table III: Ferrule Options					
Dash No.	G Ref	J Ref	Ferrule Quantity (See Note 4)		
			Std.	DS	Opt.
10	.630 (16.0)	.470 (11.9)	2	-	-
14	.870 (22.1)	.710 (18.0)	5	5	-
18	1.170 (29.7)	1.010 (25.7)	7	7	-
24	1.420 (36.1)	1.260 (32.0)	12	12	13/14/15/17
28	1.730 (43.9)	1.570 (39.9)	22	14	14/25
32	1.940 (49.3)	1.780 (52.2)	28	18	18/31

Notes:

1. Assembly identified with manufacturer's name, part number and date code, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 Series Backshell Assembly Tools are recommended for assembly and installation.
4. Drilled star is available on Table III.
5. Ferrule kit sold separately.
 687-764 ferrule and HST device kit
 687-809 ferrule and sealing device kit
 687-748 solder ferrule
 687-841-01 HST flex device

Material/Finish	
Backshell, coupling nut and star	Al alloy/Table III
Anti-decoupling device	Corrosion resistant material



470-020 StarShield™ EMI/RFI Split Composite Backshell for MIL-DTL-38999 Series III and IV Connectors



**Non
Environmental**



**Standard
Length**



Composite



**High
Ferrule Count**

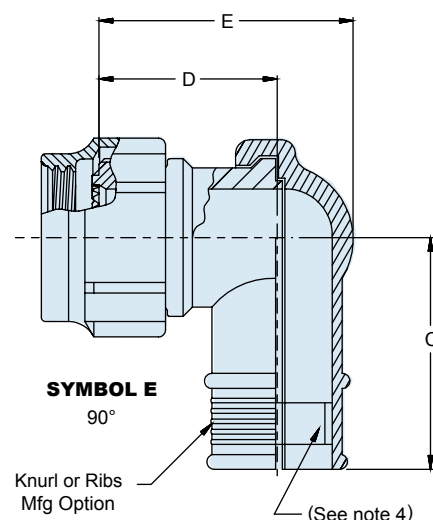
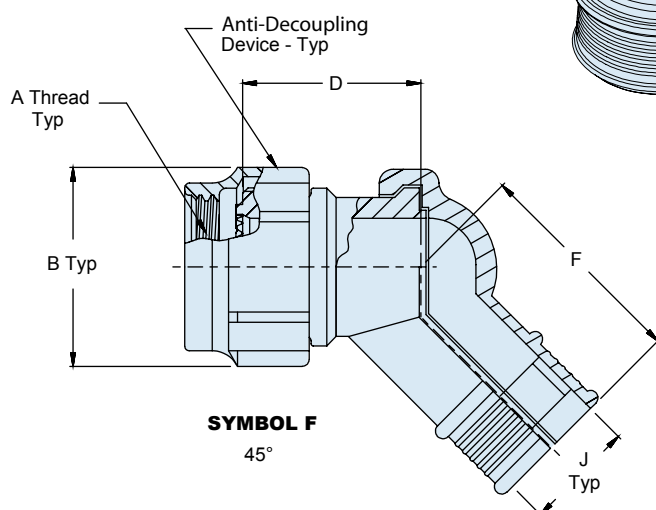
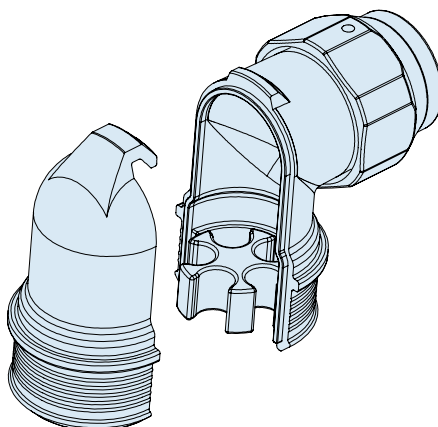
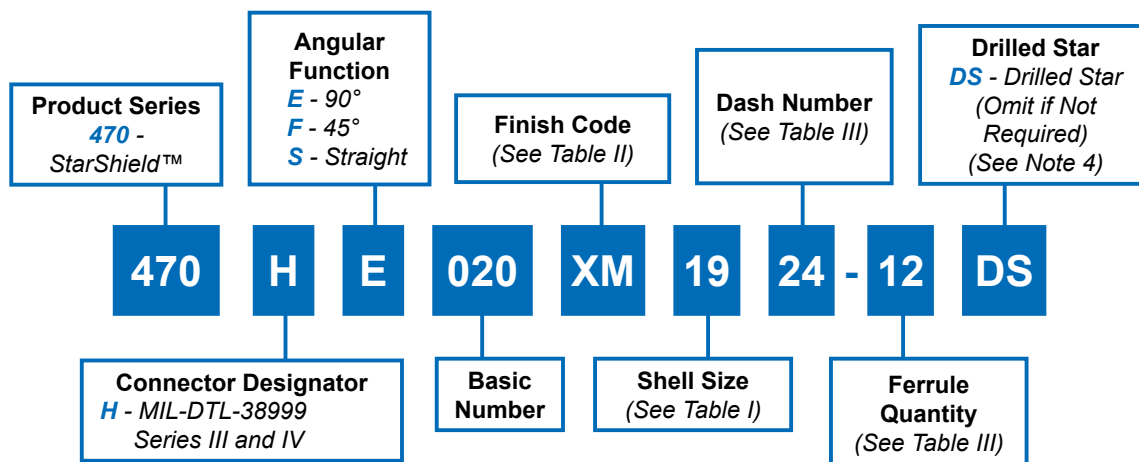


**Split
Shell**



**Self
Locking**

StarShield™ split shell, non-environmental backshell with high ferrule count



Dimensions in inches (millimeters) and are subject to change without notice.

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470-020
StarShield™ Split Composite EMI/RFI Backshell
for MIL-C-38999 Series III and IV Connectors



Table I: Dimensions

Shell Size	A Thread ISO Metric	B Max	C Max	D Max	E Max	F Max	G Flats		Max Entry
							Max	Min	
09	M12 X 1.0 - 6H	.812 (20.6)	1.995 (50.7)	1.030 (26.2)	1.339 (34.0)	1.405 (35.7)	.750 (19.1)	.736 (18.7)	14
11	M15 X 1.0 - 6H	.938 (23.8)	2.055 (52.2)	1.100 (27.9)	1.465 (37.2)	1.435 (36.4)	.875 (22.2)	.860 (21.8)	14
13	M18 X 1.0 - 6H	1.125 (28.6)	2.125 (54.0)	1.160 (29.5)	1.589 (40.4)	1.465 (37.2)	1.000 (25.4)	.980 (24.9)	18
15	M22 X 1.0 - 6H	1.250 (31.8)	2.185 (55.5)	1.220 (31.0)	1.715 (43.6)	1.485 (37.7)	1.125 (28.6)	1.100 (27.9)	24
17	M25 X 1.0 - 6H	1.375 (34.9)	2.245 (57.0)	1.310 (33.3)	1.901 (48.3)	1.515 (38.5)	1.250 (31.8)	1.224 (31.1)	24
19	M28 X 1.0 - 6H	1.500 (38.1)	2.265 (57.5)	1.370 (34.8)	2.025 (51.4)	1.535 (39.0)	1.375 (34.9)	1.348 (34.2)	24
21	M31 X 1.0 - 6H	1.625 (41.3)	2.405 (61.1)	1.370 (34.8)	2.025 (51.4)	1.565 (39.8)	1.500 (38.1)	1.469 (37.3)	28
23	M34 X 1.0 - 6H	1.750 (44.5)	2.435 (61.8)	1.440 (36.6)	2.152 (54.7)	1.595 (40.5)	1.625 (41.3)	1.581 (40.2)	28
25	M37 X 1.0 - 6H	1.875 (47.6)	2.495 (63.4)	1.560 (39.6)	2.403 (61.0)	1.615 (41.0)	1.750 (44.5)	1.690 (42.9)	32

Table II: Finish Options

Code	Finish
XM	Electroless nickel
XW	Cadmium/olive drab

Table III: Ferrule Options

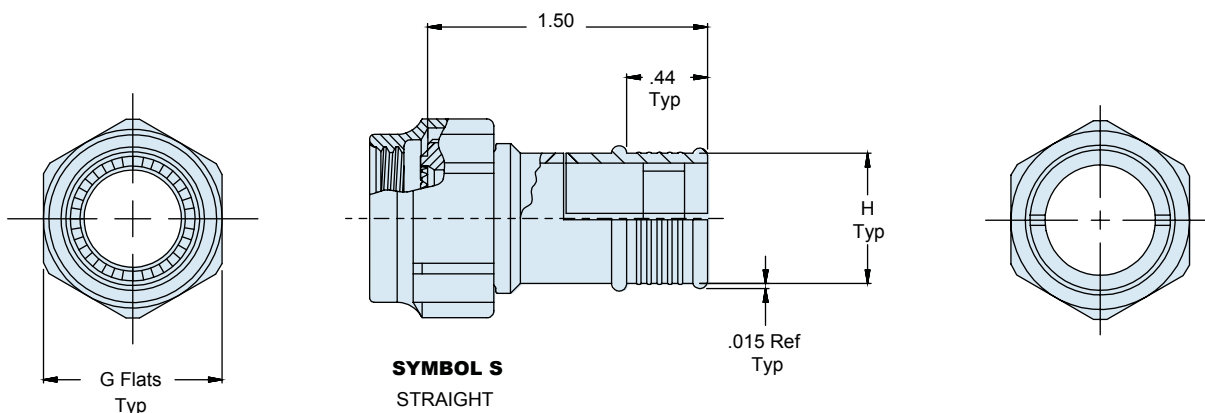
Dash No.	H Ref	J Ref	Ferrule Quantity (See Note 4)		
			Std.	DS	Opt.
10	.630 (16.0)	.470 (11.9)	2	-	-
14	.870 (22.1)	.710 (18.0)	5	5	-
18	1.170 (29.7)	1.010 (25.7)	7	7	-
24	1.420 (36.1)	1.260 (32.0)	12	12	13/14/15/17
28	1.730 (43.9)	1.570 (39.9)	22	14	14/25
32	1.940 (49.3)	1.780 (52.2)	28	18	18/31

Notes:

1. Assembly identified with manufacturer's name, part number and date code, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 Series Backshell Assembly Tools are recommended for assembly and installation.
4. Drilled star is available on Table III.
5. Ferrule kit sold separately.
687-764 ferrule and HST device kit
687-809 ferrule and sealing device kit
687-748 solder ferrule
687-841-01 HST flex device

Material/Finish

Backshell	High-grade engineering thermoplastic/ Table III
Coupling nut and anti-decoupling device	Hi-grade engineering thermoplastic/n.a.
Star	Aluminum alloy/Table II



Dimensions in inches (millimeters) and are subject to change without notice.



477-004 StarShield™ Enviromental EMI/RFI Extended Length Shield Termination Backshell For MIL-DTL-38999 Series III & IV Connectors



Environmental

Extended
LengthSelf
NestorRear End
OptionsHigh
Ferrule Count

StarShield™ environmental, extended length, backshell with self-nestor coupling

Product
Series

477

Angular Function
S = Straight
H = 45°
J = 90°

H

S

Finish Code
(See Table II)

004

Ferrule
Quantity
Code
(See Table I)

17

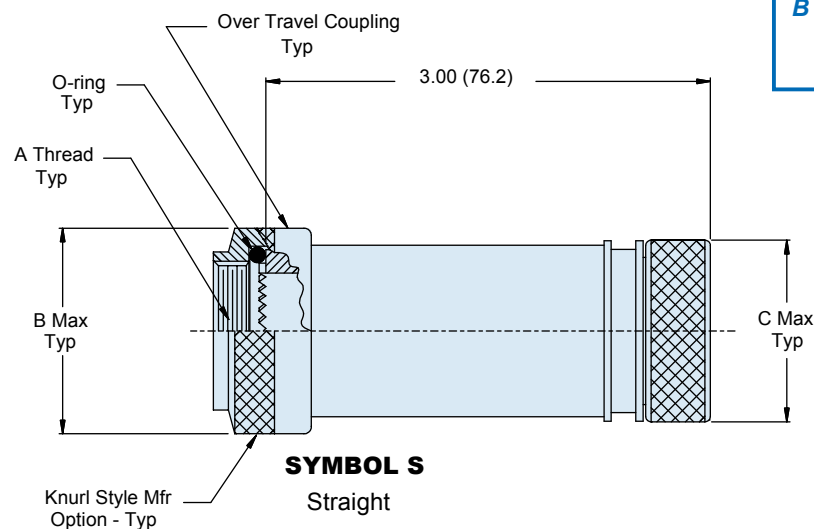
6

G

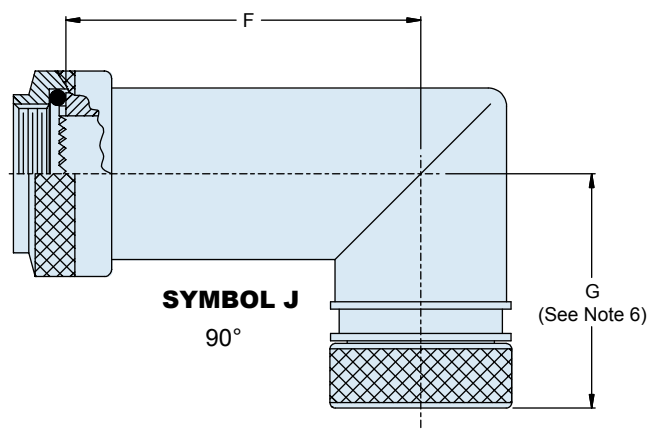
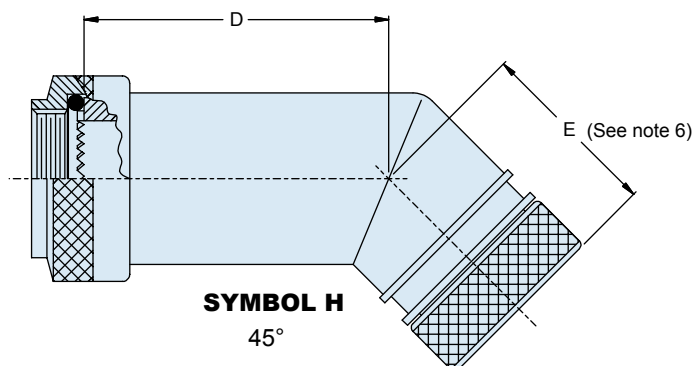
D = Drilled Star
Optional
(See note 4)

DS

- T

Connector Designator
H = MIL-DTL-38999 Series
III & IVBasic
NumberOrder No.,
(See Table I)Rear End
Options
G = Gland nut
B = Banding nut
with band
(see note 6)Shrink Boot
T = Shrink Boot - Optional
(Omit for None)
(See Table III)

Material/Finish	
Backshell, elbows, coupling & gland nut, compression ring, star, banding nut	Al alloy or CRES/ Table II
O-ring	Silicone/n.a.
Band	CRES/passivate



Dimensions in inches (millimeters) and are subject to change without notice.

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CAGE Code 06324

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477-004
StarShield™ Enviromental EMI/RFI Extended Length
Shield Termination Backshell
For MIL-DTL-38999 Series III & IV Connectors



Table I: Dimensions

Order No	Connector Shell Size Ref	A Thread Iso Metric	B Dia Max	C Dia Max	D Max	E Max (See Note 6)	F Max	G Max (See Note 6)	H ±.004 (0.10)	Ferrule Quantity (See Note 4)	
										Std.	Opt.
09	A/9	M12 X 1 - 6H	.75 (19.0)	.69(17.5)	2.49 (63.3)	1.00 (25.4)	2.63 (66.8)	1.14 (29.0)	.315 (8.00)	1	-
11	B/11	M15 X 1 - 6H	.87 (22.0)	.85(21.5)	2.51 (63.8)	1.02 (26.0)	2.69 (68.3)	1.20 (30.5)	.531 (13.50)	2	-
13	C/13	M18 X 1 - 6H	1.00 (25.5)	.89(22.5)	2.55 (64.8)	1.04 (26.5)	2.75 (69.8)	1.26 (32.0)	.591 (15.00)	3	-
15	D/15	M22 X 1 - 6H	1.20 (30.5)	1.00(25.5)	2.57 (65.3)	1.08 (27.5)	2.81 (71.3)	1.32 (33.5)	.709 (18.00)	5	-
17	E/17	M25 X 1 - 6H	1.32 (33.5)	1.12(28.5)	2.59 (65.8)	1.10 (28.0)	2.87 (72.8)	1.38 (35.0)	.827 (21.00)	6	7
19	F/19	M28 X 1 - 6H	1.46 (37.0)	1.24(31.5)	2.61 (66.3)	1.12 (28.5)	2.93 (74.3)	1.44 (36.5)	.945 (24.00)	7	-
21	G/21	M31 X 1 - 6H	1.52 (38.5)	1.38(35.0)	2.65 (67.3)	1.14 (29.0)	3.00 (76.3)	1.52 (38.5)	1.063 (27.00)	9	11
23	H/23	M34 X 1 - 6H	1.65 (42.0)	1.50 (38.0)	2.67 (67.8)	1.18 (30.0)	3.06 (77.8)	1.57 (40.0)	1.181 (30.00)	10	13
25	J/25	M37 X 1 - 6H	1.83 (46.5)	1.61 (41.0)	2.71 (68.8)	1.22 (31.0)	3.12 (79.3)	1.63 (41.5)	1.299 (33.00)	12	17

Notes:

- Assembly identified with manufacturer's name and P/N, space permitting.
- For effective grounding, connector with conductive finish should be used.
- Glenair 600 series backshell assembly tools are recommended for assembly and installation.
- Star not supplied with order number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule qty per table 1 is selected, one split and one solid star will be supplied
- Ferrule kit sold separately.
 - 687-764 ferrule and HST device kit
 - 687-748 solder ferrule
 - 687-809 ferrule and sealing device kit
 - 687-841-01 HST flex device
- Selection of banding nut option (B) will add 1.17(29.7) to indicated dimensions

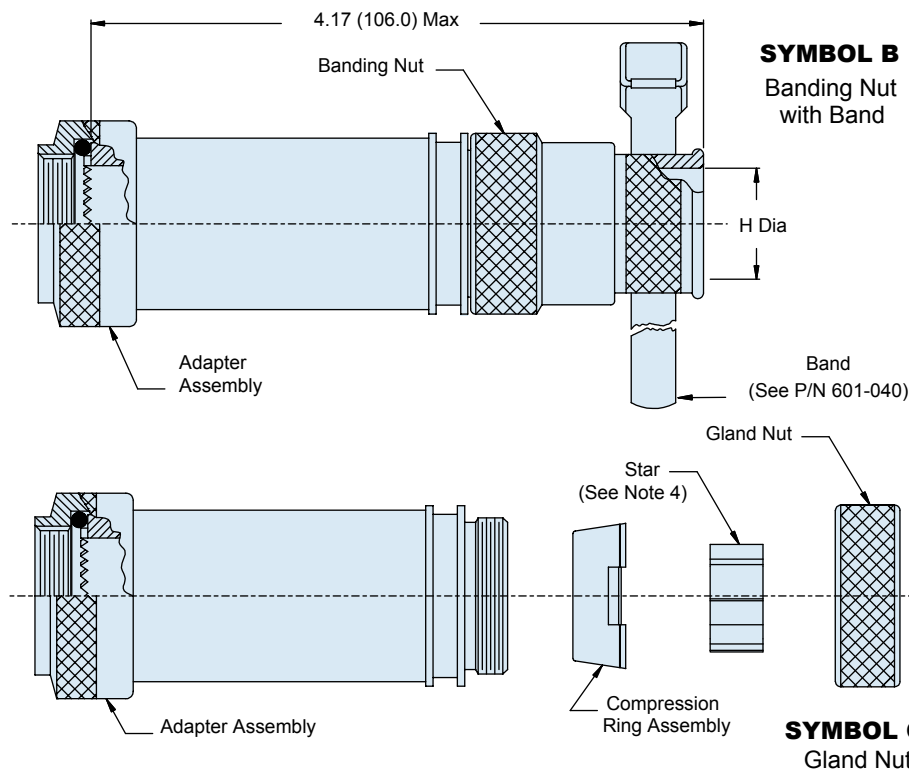


Table II: Material and Finish Options

Code	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
ZRC	Aluminum; zinc nickel over electroless nickel (RoHS)
Z1	Stainless steel; passivate
ZM	Stainless steel; electroless nickel

Table III: Shrink Boot

Shell Size	Shrink Boot Ref. Part No.
09	770-001S1 04
11	770-001S1 06
13	770-001S1 06
15	770-001S1 07
17	770-001S1 07
19	770-001S1 08
21	770-001S1 08
23	770-001S1 08
25	770-001S1 09

Dimensions in inches (millimeters) and are subject to change without notice.



477-005

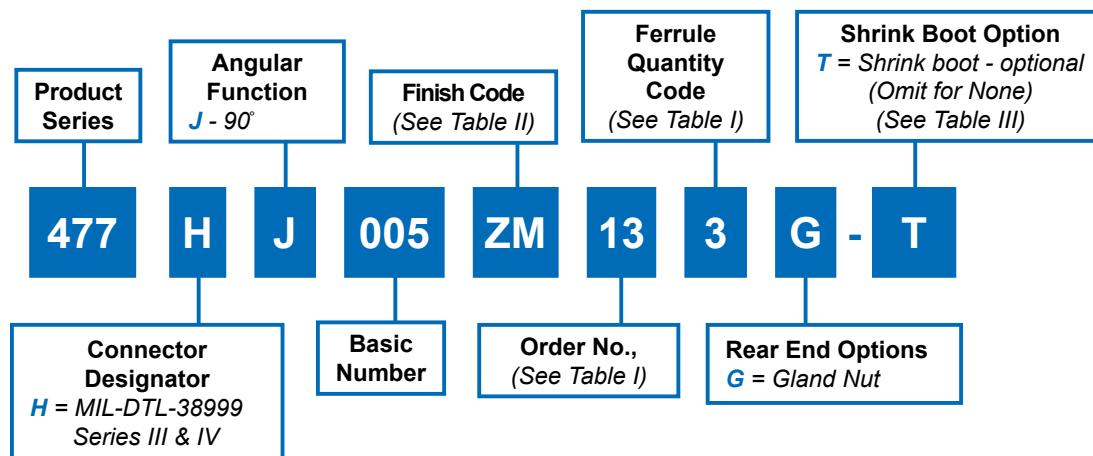
StarShield™ 90° EMI/RFI Shield Termination Backshell For MIL-DTL-38999 Series III & IV Connectors



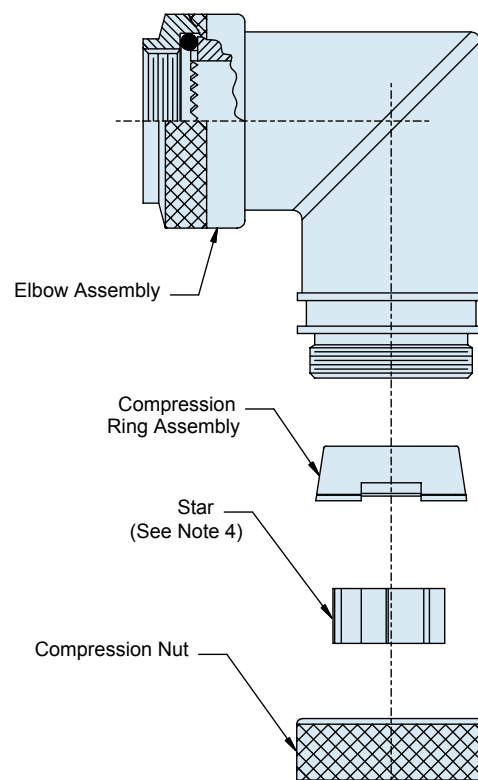
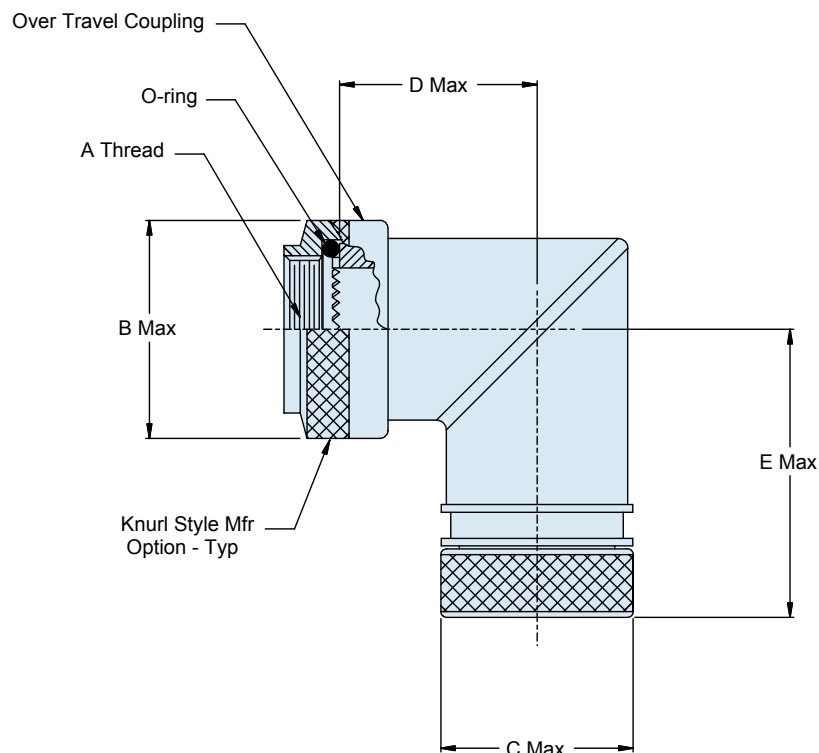
Environmental

Self
NestorExtended
Length

StarShield™ 90°, extended length, environmental backshell with self-nestor coupling



SYMBOL G
Gland Nut



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477-005
StarShield™ 90° EMI/RFI Shield Termination Backshell
For MIL-DTL-38999 Series III & IV Connectors



Table I: Dimensions

Order No	Connector Shell Size Ref	A Thread ISO Metric	B Dia Max	C Dia Max	D Max	E Max	Ferrule Quantity
							Standard
09 ⁴	A/9	M12X 1 - 6H	.75 (19.0)	.69(17.5)	.88 (22.5)	1.20 (30.5)	1
11	B/11	M15X 1 - 6H	.87 (22.0)	.85(21.5)	.94 (24.0)	1.26 (32.0)	2
13	C/13	M18 X 1 - 6H	1.00 (25.4)	.89(22.5)	1.02 (26.0)	1.34 (34.0)	3

Table II: Material and Finish Options

Code	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
Z1	Stainless steel; passivate
ZM	Stainless steel; electroless nickel

Table III: Shrink Boot

Shell Size	Shrink Boot Part No.
09	770-001S1 04
11	770-001S1 06
13	770-001S1 06

Material/Finish

Elbow, coupling & gland nut, compression ring, star	CRES or Al alloy/Table II
O-ring	Silicone/n.a.

Notes:

1. Assembly identified with manufacturer's name and P/N, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Star not supplied with order number 09.
5. Ferrule kit sold separately.
 687-764 ferrule and HST device kit
 687-809 ferrule and sealing device kit
 687-748 solder ferrule
 687-841-01 HST flex device

Dimensions in inches (millimeters) and are subject to change without notice.



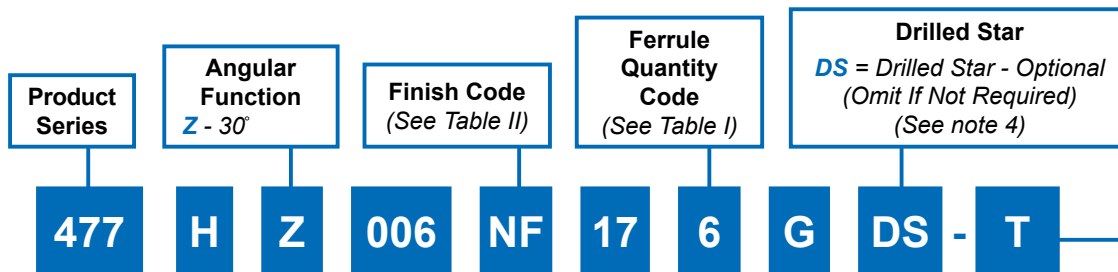
477-006
StarShield™ 30° EMI/RFI Shield Termination
Backshell
 For MIL-DTL-38999 Series III & IV Connectors



Environmental

Self
NestorStandard
LengthRear End
OptionsHigh
Ferrule Count

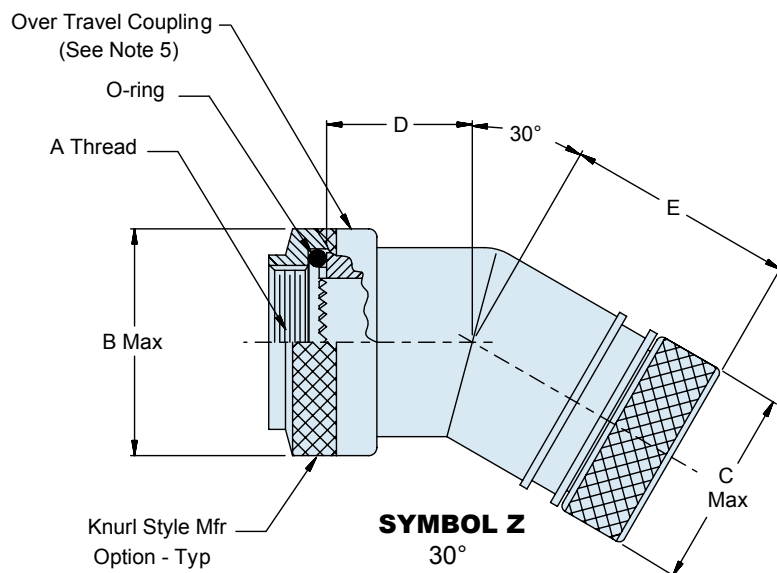
StarShield™ 30° environmental, high ferrule count backshell with self-nestor coupling

**Connector Designator***H* = MIL-DTL-38999 Series III & IV**Basic Number****Order No.,**
(See Table I)**Rear End Options**

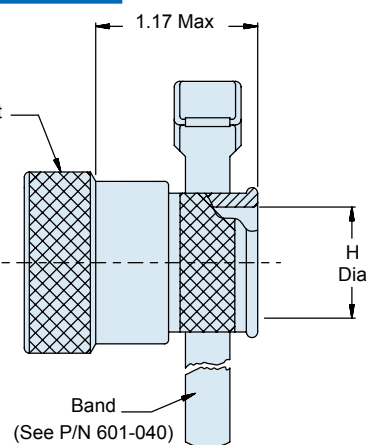
B = Banding Nut With Band
C = Conduit Backshell
G = Gland Nut
T = Tinel Nut With Tinel Ring for Single Braid

Shrink Boot Option

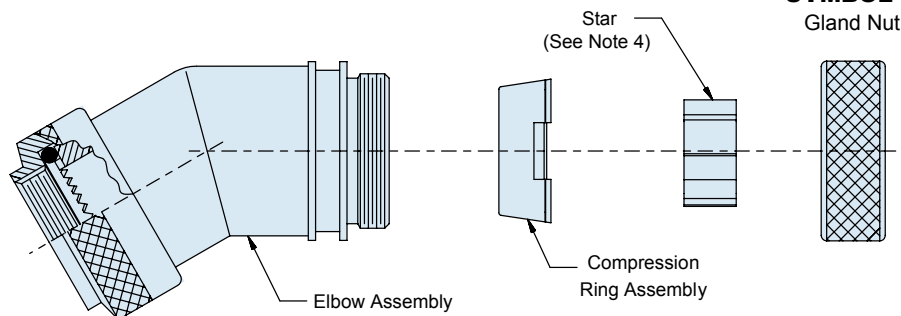
T = Shrink boot - optional
 (Omit for None)
 (See Table III)

**SYMBOL B**

Banding Nut with Band

**SYMBOL G**

Gland Nut



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477-006
StarShield™ 30° EMI/RFI Shield Termination
Backshell
For MIL-DTL-38999 Series III & IV Connectors



Table I: Dimensions

Order No	Connector Shell Size Ref	A Thread ISO Metric	B Dia Max	C Dia Max	D Max	E Max	F ±.003 (.08)	G Thread ISO Metric	H ±.004 (0.10)	Ferrule Quantity (See Note 4)	
										Std.	Optional
09	A/9	M12 X 1 - 6H	.75 (19.0)	.69 (17.5)	.45(11.5)	.94 (24.0)	.435 (11.0)	M12X 1 - 6g	.315 (8.00)	1	-
11	B/11	M15 X 1 - 6H	.87 (22.0)	.85 (21.5)	.47(12.0)	.96 (24.5)	.623 (15.8)	M15X 1 - 6g	.531 (13.50)	2	-
13	C/13	M18 X 1 - 6H	1.00 (25.5)	.89 (22.5)	.49(12.5)	.98 (25.0)	.746 (18.9)	M18 X 1 - 6g	.591 (15.00)	3	-
15	D/15	M22 X 1 - 6H	1.20 (30.5)	1.00 (25.5)	.51(13.0)	1.00 (25.5)	.871 (22.1)	M22 X 1 - 6g	.709 (18.00)	5	-
17	E/17	M25 X 1 - 6H	1.32 (33.5)	1.12 (28.5)	.53(13.5)	1.02 (26.0)	.996 (25.3)	M25 X 1 - 6g	.827 (21.00)	6	7
19	F/19	M28 X 1 - 6H	1.46 (37.0)	1.24 (31.5)	.55(14.0)	1.04 (26.5)	1.121 (28.5)	M28 X 1 - 6g	.945 (24.00)	7	-
21	G/21	M31 X 1 - 6H	1.52 (38.5)	1.38 (35.0)	.57(14.5)	1.06 (27.0)	1.245 (31.6)	M31 X 1 - 6g	1.063 (27.00)	9	11
23	H/23	M34 X 1 - 6H	1.65 (42.0)	1.50 (38.0)	.59(15.0)	1.08 (27.5)	1.371 (34.8)	M34 X 1 - 6g	1.181 (30.00)	10	11,12,13,15
25	J/25	M37 X 1 - 6H	1.83 (46.5)	1.61 (41.0)	.61(15.5)	1.10 (28.0)	1.371 (34.8)	M37 X 1 - 6g	1.299 (33.00)	12	13,14,15,17,18

Table II: Material and Finish Options

Code	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
Z1	Stainless steel; passivate
ZM	Stainless steel; electroless nickel

Table III: Shrink Boot

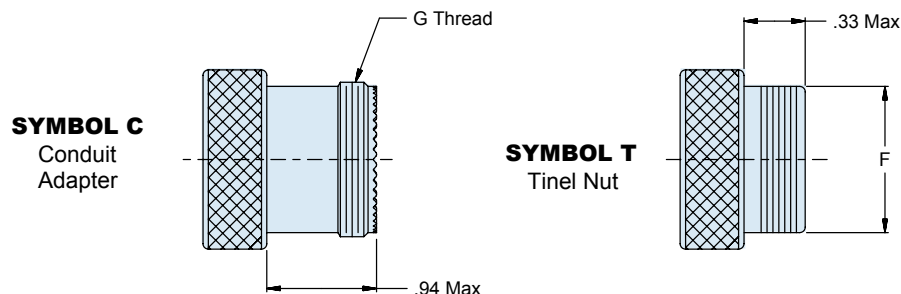
Shell Size	Shrink Boot Ref. Part Number
09	770-001S1 04
11	770-001S1 06
13	770-001S1 06
15	770-001S1 07
17	770-001S1 07
19	770-001S1 08
21	770-001S1 08
23	770-001S1 08
25	770-001S1 09

Notes:

1. Assembly identified with manufacturer's name and P/N, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Star not supplied with order number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule qty per Table 1 is selected, one split and one solid star will be supplied
5. Over-travel coupling design provides self-seating & self-locking functionality eliminating lock-wire requirements.
6. Ferrule kit sold separately.
687-764 ferrule and HST device kit
687-809 ferrule and sealing device kit
687-748 solder ferrule
687-841-01 HST flex device

B

Materials/Finish	
Backshell, elbows, coupling & gland nut, compression ring, star	Al alloy or CRES/ Table III
O-ring	Silicone/n.a.
Tinel ring-nickel	Titanium alloy/n.a.
Band	CRES/passivate



Dimensions in inches (millimeters) and are subject to change without notice.



477-007

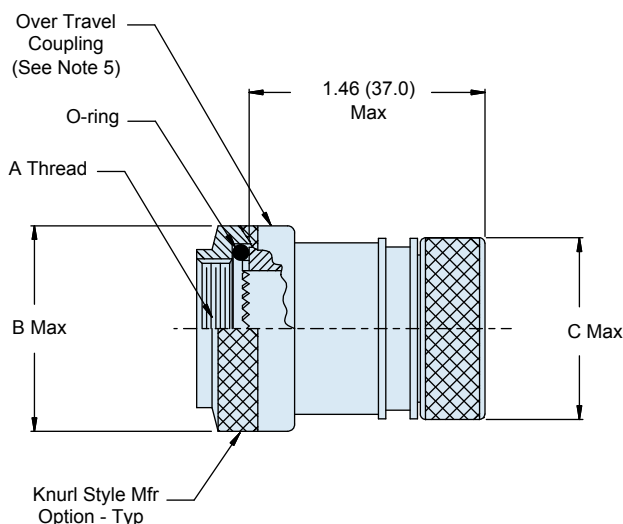
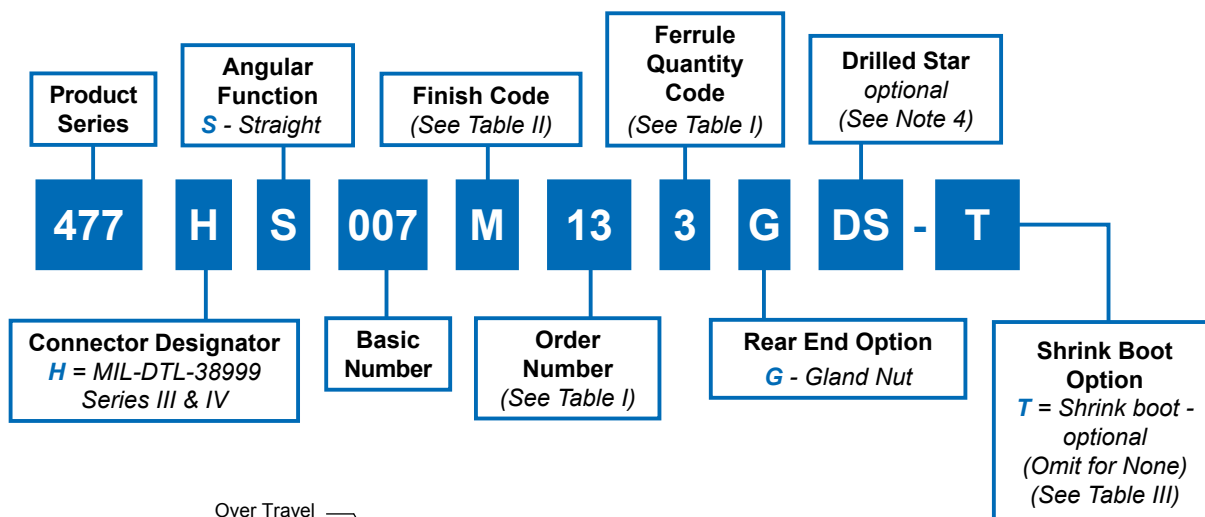
StarShield™ EMI/RFI Shield Termination Backshell For MIL-DTL-38999 Series III & IV connectors



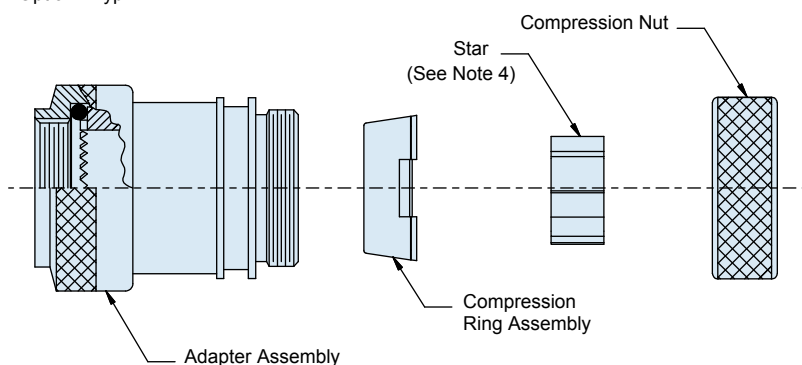
Environmental

Self
NestorExtended
LengthRear End
OptionsHigh
Ferrule Count

StarShield™ environmental, extended length backshell with self-nestor coupling



SYMBOL S
Straight



SYMBOL G
Gland Nut

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477-007
StarShield™ EMI/RFI Shield Termination Backshell
For MIL-DTL-38999 Series III & IV connectors



Table I: Dimensionsw

Order No	Connector Shell Size Ref	A Thread ISO Metric	B Dia Max	C Dia Max	Ferrule Quantity (See Note 4)	
					Std.	Opt.
09	A/9	M12 X 1 - 6H	.75 (19.0)	.69(17.5)	1	-
11	B/11	M15 X 1 - 6H	.87 (22.0)	.85 (21.5)	2	-
13	C/13	M18 X 1 - 6H	1.00 (25.5)	.89 (22.5)	3	-
15	D/15	M22 X 1 - 6H	1.20 (30.5)	1.00 (25.5)	5	-
17	E/17	M25 X 1 - 6H	1.32 (33.5)	1.12 (28.5)	6	7
19	F/19	M28 X 1 - 6H	1.46 (37.0)	1.24 (31.5)	7	-
21	G/21	M31 X 1 - 6H	1.52 (38.5)	1.38 (35.0)	9	11
23	H/23	M34 X 1 - 6H	1.65 (42.0)	1.50 (38.0)	10	13
25	J/25	M37 X 1 - 6H	1.83 (46.5)	1.61 (41.0)	12	17

Table II: Material and Finish Options

Code	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
Z1	Stainless steel; passivate
ZM	Stainless steel; electroless nickel

Table III: Shrink Boots

Shell Size	Shrink Boot Ref. Part Number
09	770-001S1 04
11	770-001S1 06
13	770-001S1 06
15	770-001S1 07
17	770-001S1 07
19	770-001S1 08
21	770-001S1 08
23	770-001S1 08
25	770-001S1 09

Material/Finish

Backshell, gland nut, compression ring, and star	Al alloy/Table II
Coupling nut	Stainless steel/passivate
O-ring	Silicone/n.a.

Notes:

1. Assembly identified with manufacturer's name and P/N, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Star not supplied with order number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule qty per Table I is selected, one split and one solid star will be supplied.
5. Over-travel coupling design provides self-seating & self-locking functionality eliminating lock-wire requirements.
6. Ferrule kit sold separately.
687-764 ferrule and HST device kit
687-809 ferrule and sealing device kit
687-748 solder ferrule
687-841-01 HST flex device

Dimensions in inches (millimeters) and are subject to change without notice.



477-008

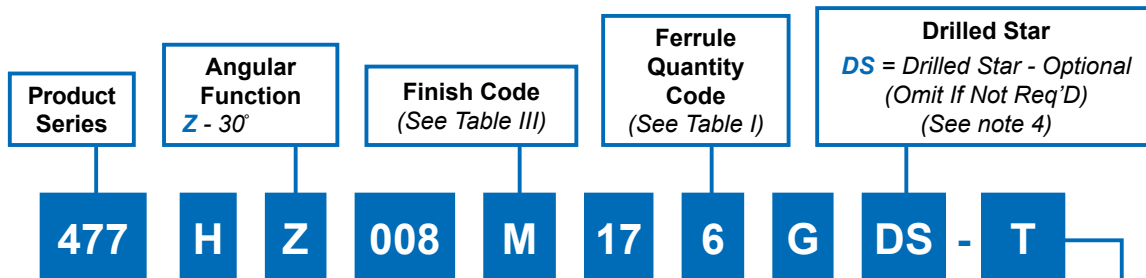
StarShield™ 30° Environmental EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series III & IV Connectors



Environmental

Self
NestorRear End
OptionsStandard
LengthHigh
Ferrule Count

StarShield™ 30°, environmental, high ferrule count backshell with self-nestor coupling

**Connector Designator**

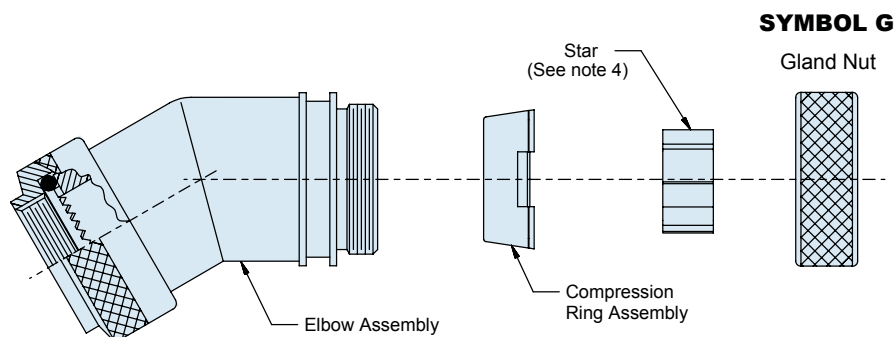
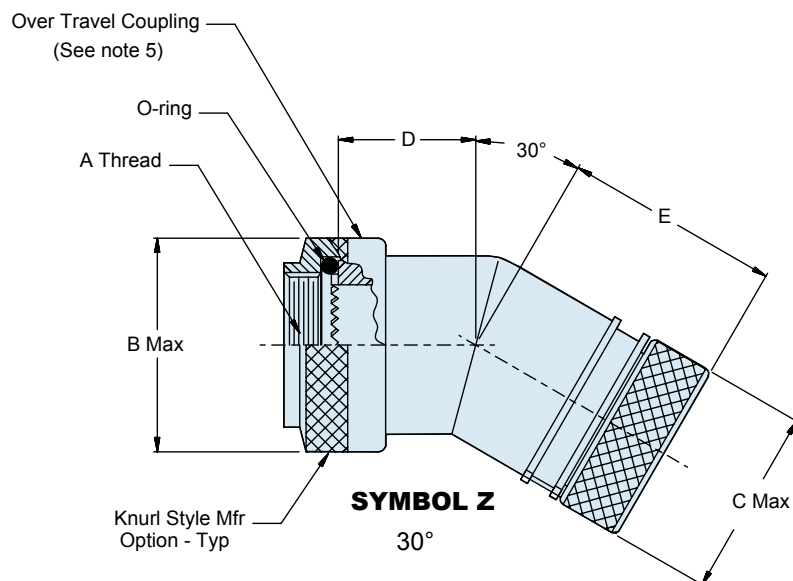
H = MIL-DTL-38999 Series III & IV

Basic Number**Order No.**
(See Table I)**Rear End Options**

B = Banding Nut With Band
C = Conduit Adapter
G = Gland Nut
T = Tinel Nut With Tinel Ring for Single Braid

Shrink Boot Option

T = Shrink boot - optional
(Omit for None)
(See Table III)



Dimensions in inches (millimeters) and are subject to change without notice.

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477-008
StarShield™ 30° Environmental EMI/RFI Shield
Termination Backshell
for MIL-DTL-38999 Series III & IV Connectors



Table I: Dimensions

Order No	Connector Shell Size Ref	A Thread Iso Metric	B Dia Max	C Dia Max	D Max	E Max	F ±.003 (.08)	G Thread ISO Metric	H ±.004 (0.10)	Ferrule Quantity (See Note 4)	
										Std.	Optional
09	A/9	M12 X 1 - 6H	.75 (19.0)	.69(17.5)	.45(11.5)	.94(24.0)	.435 (11.0)	M12X 1 - 6g	.315 (8.00)	1	-
11	B/11	M15 X 1 - 6H	.87 (22.0)	.85(21.5)	.47(12.0)	.96(24.5)	.623 (15.8)	M15X 1 - 6g	.531 (13.50)	2	-
13	C/13	M18 X 1 - 6H	1.00 (25.5)	.89(22.5)	.49(12.5)	.98(25.0)	.746 (18.9)	M18 X 1 - 6g	.591 (15.00)	3	-
15	D/15	M22 X 1 - 6H	1.20 (30.5)	1.00(25.5)	.51(13.0)	1.00(25.5)	.871 (22.1)	M22 X 1 - 6g	.709 (18.00)	5	-
17	E/17	M25 X 1 - 6H	1.32 (33.5)	1.12(28.5)	.53(13.5)	1.02(26.0)	.996 (25.3)	M25 X 1 - 6g	.827 (21.00)	6	7
19	F/19	M28 X 1 - 6H	1.46 (37.0)	1.24(31.5)	.55(14.0)	1.04(26.5)	1.121 (28.5)	M28 X 1 - 6g	.945 (24.00)	7	-
21	G/21	M31 X 1 - 6H	1.52 (38.5)	1.38(35.0)	.57(14.5)	1.06(27.0)	1.245 (31.6)	M31 X 1 - 6g	1.063 (27.00)	9	11
23	H/23	M34 X 1 - 6H	1.65 (42.0)	1.50(38.0)	.59(15.0)	1.08(27.5)	1.371 (34.8)	M34 X 1 - 6g	1.181 (30.00)	10	11,12,13,15
25	J/25	M37 X 1 - 6H	1.83 (46.5)	1.61(41.0)	.61(15.5)	1.10(28.0)	1.371 (34.8)	M37 X 1 - 6g	1.299 (33.00)	12	13,14,15,17,18

Notes:

1. Assembly identified with manufacturer's name and P/N, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Star not supplied with order number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule qty per Table 1 is selected, one split and one solid star will be supplied
5. Over-travel coupling design provides self-seating & self-locking functionality eliminating lock-wire requirements.
6. Ferrule kit sold separately.
 687-764 ferrule and HST device kit
 687-809 ferrule and sealing device kit
 687-748 solder ferrule
 687-841-01 HST flex device

Table II: Material and Finish Options

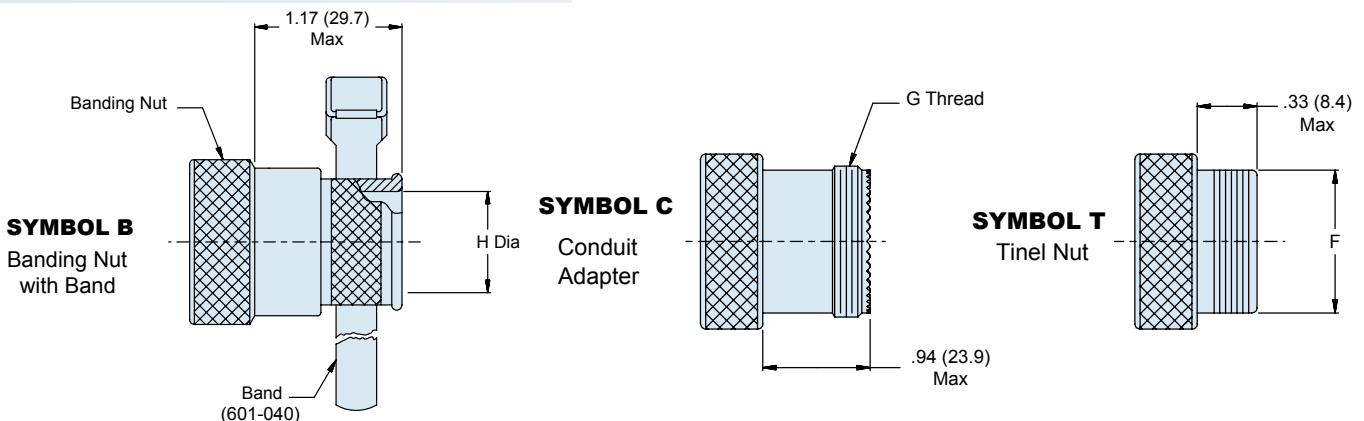
Code	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
Z1	Stainless steel; passivate
ZM	Stainless steel; electroless nickel

Table III: Shrink Boots

Shell Size	Shrink Boot Ref. Part No.
09	770-001S1 04
11	770-001S1 06
13	770-001S1 06
15	770-001S1 07
17	770-001S1 07
19	770-001S1 08
21	770-001S1 08
23	770-001S1 08
25	770-001S1 09

Material/Finish

Backshell, elbows, gland nut, compression ring, star	Aluminum alloy or CRES/Table III
Coupling nut	Stainless steel/passivate
O-ring	Silicone/n.a.
Tinel ring-nickel	Titanium alloy/n.a.
Band	CRES/passivate



Dimensions in inches (millimeters) and are subject to change without notice.



477-009

StarShield™ EMI/RFI Shield Termination Backshell For MIL-DTL-38999 Series III & IV Connectors

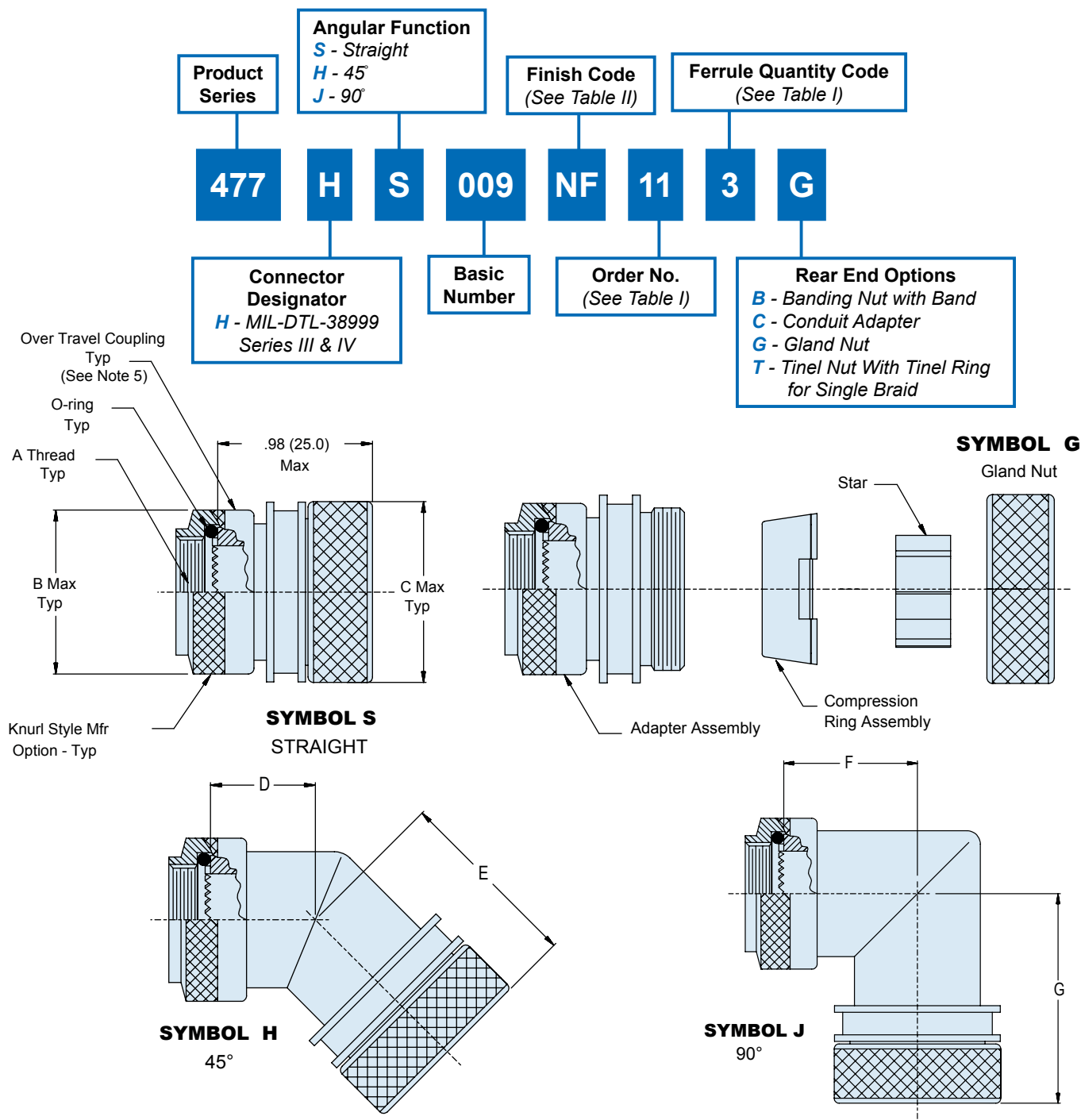


Environmental

Standard
LengthSelf
NestorRear End
Options

StarShield™ environmental backshell with self-nestor and rear end options

B



Dimensions in inches (millimeters) and are subject to change without notice.

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477-009
StarShield™ EMI/RFI Shield Termination Backshell
For MIL-DTL-38999 Series III & IV Connectors



Table I: Dimensions

Order No	Connector Shell Size Ref	A Thread ISO Metric	B Dia Max	C Dia Max	D Max	E Max	F Max	G Max	H ± .003 (.08)	J Thread ISO Metric	K ± .004 (0.10)	Ferrule Quantity
11	B/11	M15 x 1 - 6H	.87 (22.0)	.85 (21.5)	.51 (13.0)	1.02 (26.0)	.69 (17.5)	1.20 (30.5)	.746 (18.9)	M18 X 1 - 6g	.591 (15.00)	3

Table II: Material and Finish Options

Code	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
Z1	Stainless steel passivate
ZM	Stainless steel/electroless nickel

Material/Finish:

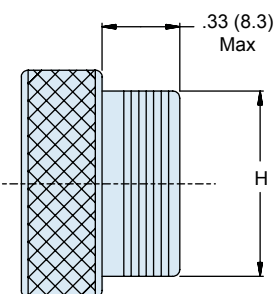
Backshell, Elbows, Coupling & Gland Nut, Compression Ring, Star	Al alloy or CRES/Table II
O-Ring	Silicone/n.a.
Tinel Ring-Nickel	Titanium alloy/n.a.
Band	CRES/passivate

Notes:

1. Assembly identified a manufacturer's name and P/N, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Shrink boot reference part number 770-001S106
5. Over-travel coupling design provides self-seating & self-locking functionality eliminating lock-wire requirements.
6. Ferrules sold separately. See part number 687-858 in this catalog.
7. Ferrule kit sold separately.
 687-764 ferrule and HST device kit
 687-809 ferrule and sealing device kit
 687-748 solder ferrule
 687-841-01 HST flex device

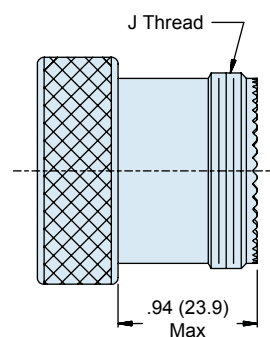
SYMBOL T

Tinel Nut



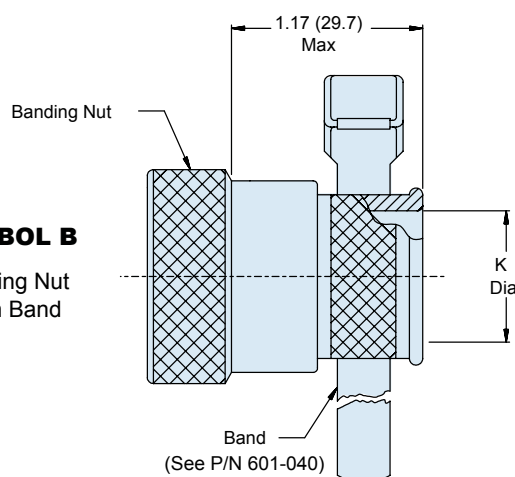
SYMBOL C

Conduit Adapter



SYMBOL B

Banding Nut with Band



Dimensions in inches (millimeters) and are subject to change without notice.



470-021 StarShield™ environmental EMI/RFI Shield Termination Backshell for 800 Series Mighty Mouse Connectors



Environmental

Direct
Coupling

StarShield™ direct coupling, Mighty Mouse backshell with split banding porch

Product Series
470 - StarShield™

Angular Function
S - Straight

Finish Code
(See Table II)

Band Option
B - Band (See Part Number 601-060)
K - Precoiled Band
(See Part Number 601-061)
(Omit for None)

470

M

S

021

M

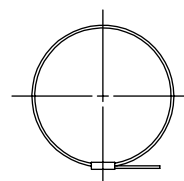
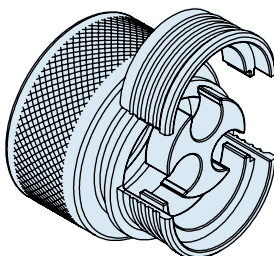
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B

- T

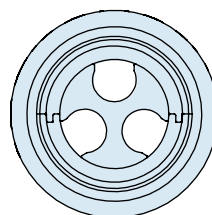
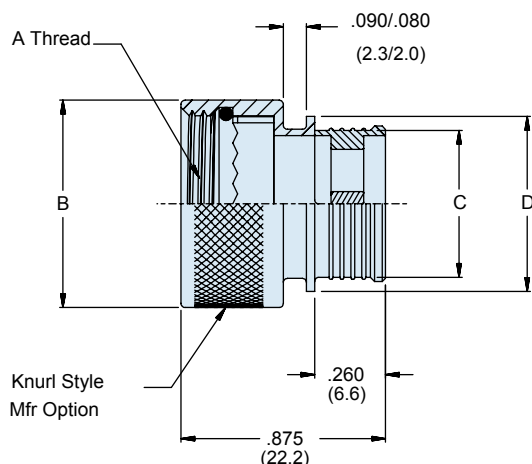
Connector Designator
(See Table I)

Basic Number
Order Number
(See Table I)

Shrink Boot
(Omit for None)
(See Table III)


SYMBOL K

Band



Dimensions in inches (millimeters) and are subject to change without notice.

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470-021
StarShield™ environmental EMI/RFI Shield
Termination Backshell
for 800 Series Mighty Mouse Connectors



Table I: Dimensions							
Order No	Shell Size Ref		A Thread Class -2B	B Dia Max	C Dia	D Dia	No. Of Ferrules
	800/801 803/804	805					
07 see Note 3	07	09	7/16-28 UNEF	0.530 (13.4)	.414 (10.5)	.516 (13.1)	1
09 see Note 3	09	11	9/16-24 UNEF	0.650 (16.5)	.414 (10.5)	.516 (13.1)	1
10	10	12	5/8-24 UNEF	0.715 (13.0)	.539 (13.7)	.641 (16.3)	2
12	11/12/13	13	11/16-24 UNEF	0.785 (19.9)	.601 (15.3)	.703 (17.9)	3
13	N/A	15	3/4-20 UNEF	0.830 (21.0)	.601 (15.3)	.703 (17.9)	3
14	14/15/16/17	18/19	15/16-20 UNEF	1.020 (25.9)	.851 (21.6)	.953 (24.2)	7
17	21	23	1 3/16-18 UNEF	1.280 (32.5)	.914 (23.2)	1.016 (25.8)	12

Table II: Material and Finish Options	
Code	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
ZRC	Aluminum; zinc nickel over electroless nickel (RoHS)
Z1	Stainless steel; passivate
ZM	Stainless steel; electroless nickel

Table III: Shrink Boot	
Order No	Shrink Boot Ref
07	809S060 -3
09	809S060 -3
10	809S060 -4
12	809S060 -4
13	809S060 -4
14	809S060 -5
17	809S060 -6

Material/Finish	
Adapter, Star, Clamp	See Table II
O-ring	Silicone/n.a.
Band	Stainless steel/passivate.

Notes:

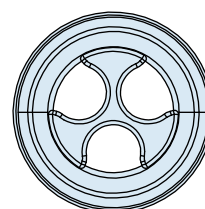
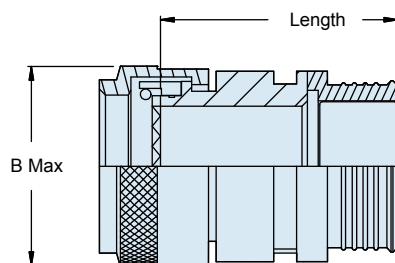
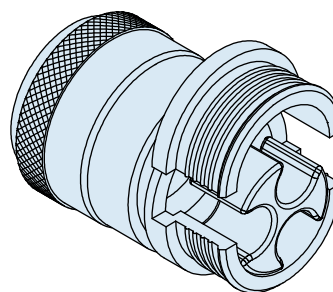
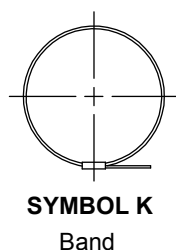
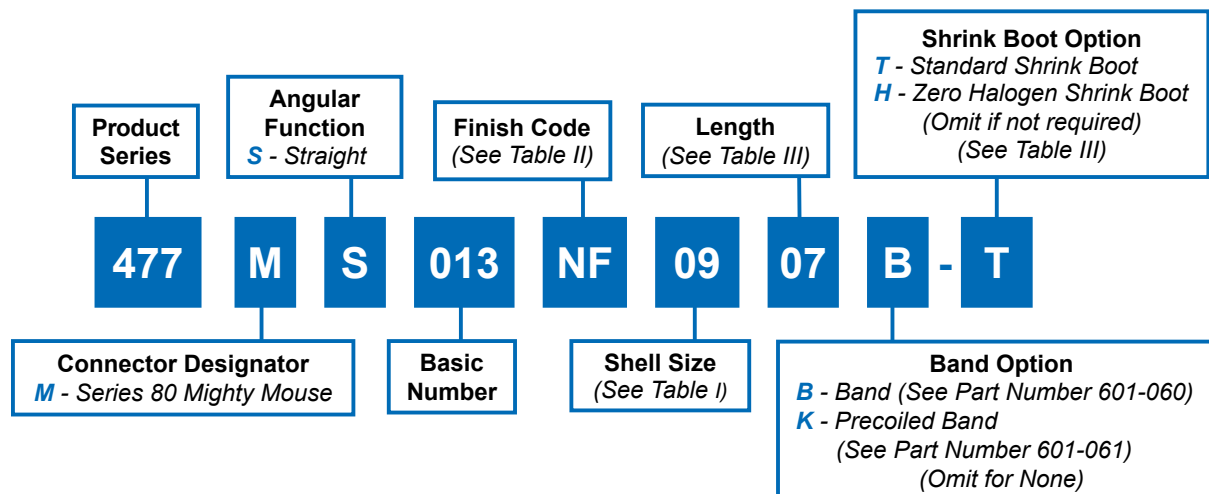
1. Assembly identified with manufacturer's name and P/N space permitting.
2. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
3. Star not supplied with order number 07 & 09.
4. Ferrule kit sold separately. See part number 687-858 in this catalog.



477-013 StarShield™ Extended Length EMI/RFI Shield Termination Backshell for 800 Series Mighty Mouse Connectors



StarShield™ direct coupling, Mighty Mouse backshell with split banding porch



477-013
StarShield™ Extended Length EMI/RFI Shield
Termination Backshell
for 800 Series Mighty Mouse Connectors



Table I: Dimensions					
Order No	Shell Size Ref		A Thread Class -2B	B Max	Ferrule
	800/801 803/804	805			
05	05	N/A	1/4-32 UNEF	.470 (11.9)	01
06	06	N/A	5/16-32 UNEF	.530 (13.5)	01
11	N/A	08	3/8-32 UNEF	.570 (14.5)	01
07	07	09	7/16-28 UNEF	.637 (16.2)	01
08	08	10	1/2-28 UNEF	.700 (17.8)	01
09	09	11	9/16-24 UNEF	.758 (19.3)	02
10	10	12	5/8-24 UNEF	.819 (20.8)	03
12	11/12/13	13	11/16-24 UNEF	.896 (22.8)	03
13	N/A	15	3/4-20 UNEF	.930 (23.6)	05
14	14/15/16/17	18/19	15/16-20 UNEF	1.137 (28.9)	06
17	21	23	1 3/16-18 UNEF	1.387 (35.2)	09

Table II: Material and Finish Options	
Code	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
Z1	Stainless steel passivate
ZM	Stainless steel/electroless nickel

Table III: Shrink Boot	
Length Code	Length
07	0.88
08	1.00
09	1.13
10	1.25
11	1.38
12	1.50
13	1.63
14	1.75
15	1.88
16	2.00

Notes

1. Assembly identified with manufacturer's name and P/N, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Ferrule kit sold separately.
 687-764 ferrule and HST device kit
 687-809 ferrule and sealing device kit
 687-748 solder ferrule
 687-841-01 HST flex device

Material/Finish	
Backshell, clamp, coupling nut and star	Aluminum alloy/Table II
O-rings	Silicone/n.a.
Band	Stainless steel/passivate

Dimensions in inches (millimeters) and are subject to change without notice.



527-448 StarShield™ Non-Environmental EMI/RFI Backshell Assembly for size 2 ARINC 600 series connector



StarShield™ non-environmental backshell assembly with rear end options

Shrink Boot Option

T = Shrink Boot
(Omit if not required)
Recommended to use
with open wire bundle

Product
Series

527

Finish Code
(See Table II)

448

Rear End Options
(See Table III)

NF

18

G

DS

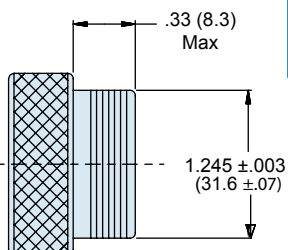
- T

Basic
Number

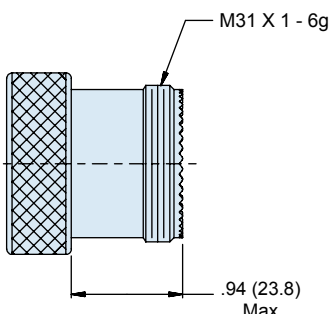
Ferrule
Quantity
Code
(See Table I)

Drilled Star
Optional (Omit If Not Required)
(See Table IV) (See note 4)

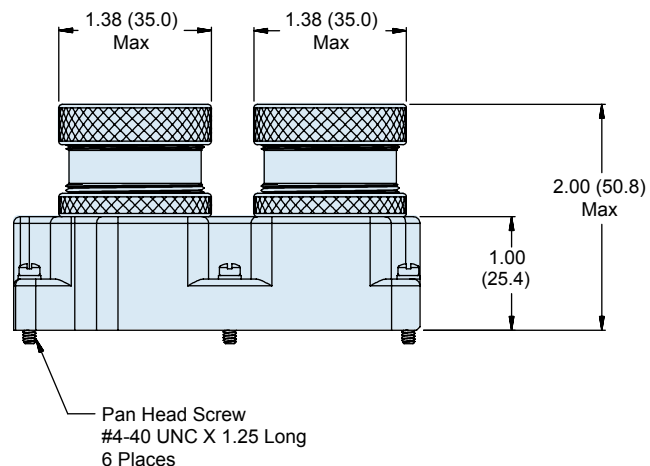
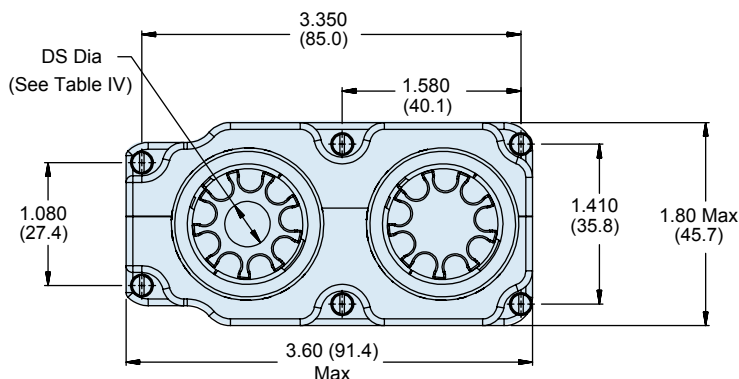
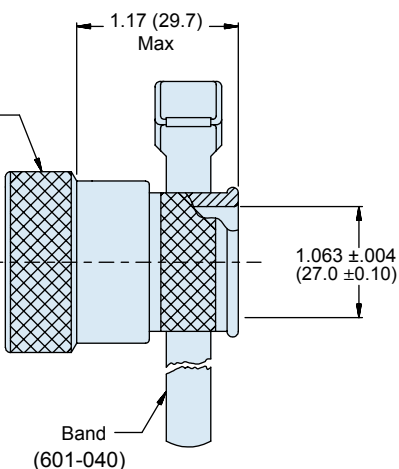
SYMBOL T
Tinel Nut



SYMBOL C
Conduit
Adpater



SYMBOL B
Banding Nut
with Band



Dimensions in inches (millimeters) and are subject to change without notice.

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527-448
StarShield™ Non-Enviromental
EMI/RFI Backshell Assembly
for size 2 ARINC 600 series connector



Table I: Ferrule Quantity						
Cavity	A			B		
Ferrule Quantity Code	0	9	11 ⁵	0	9	11 ⁵
9		x		x		
11			x	x		
18		x			x	
20		x				x
22			x			x

Table II: Material and Finish Options	
Symbol	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
Z1	Stainless steel passivate
ZM	Stainless steel/electroless nickel

Table III: Backend Styles	
Code	Description
B	Banding nut with band
C	Conduit adapter
G	Gland nut
T	Tinel nut with tinell ring for single braid

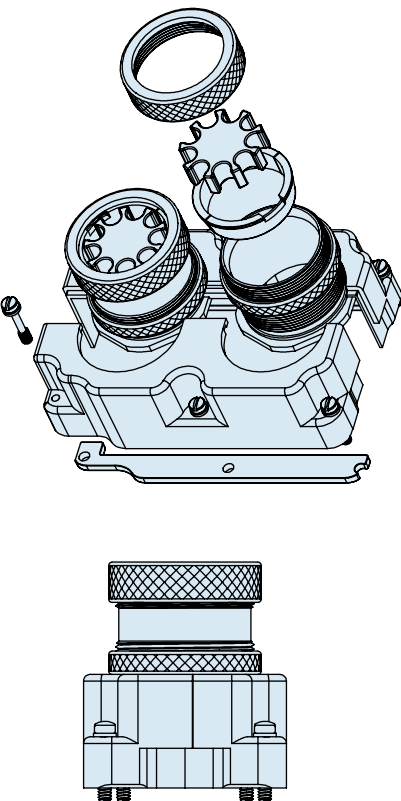


Table IV: Drilled Star Dimensions	
Ferrule Quantity	DS Dia Max (See note 4)
9	.47 (9.9)

Material/Finish:	
Backshell, adapters, nuts, coupling & gland nuts, compression rings, clips, stars	Al alloy/see Table II
Hardware	CRES/passivate

Notes:

1. Assembly identified with manufacturer's name and P/N, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Drilled star option is not available for stars holding 11 ferrules.
5. 11 ferrule star contains a split 8 ferrule star and a 3 ferrule star.
6. Ferrule kit sold separately.
687-764 ferrule and HST device kit
687-809 ferrule and sealing device kit
687-748 solder ferrule
687-841-01 HST flex device
7. Shrink boot ref. P/N 770-001S108.



527-449 StarShield™ EMI/RFI Backshell Assembly for size 2 ARINC 600 series connector



**Non
Environmental**



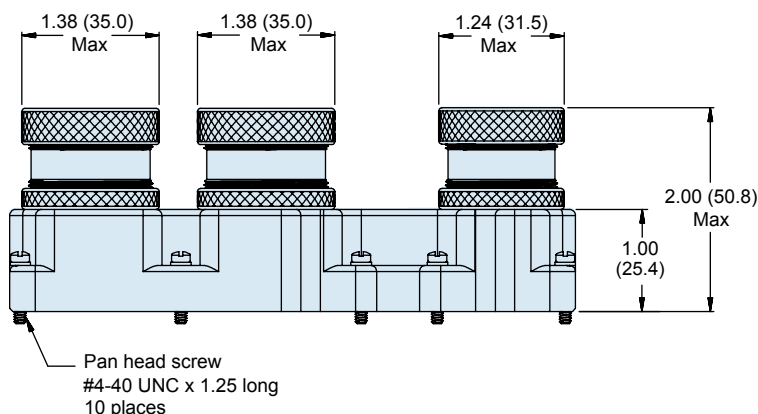
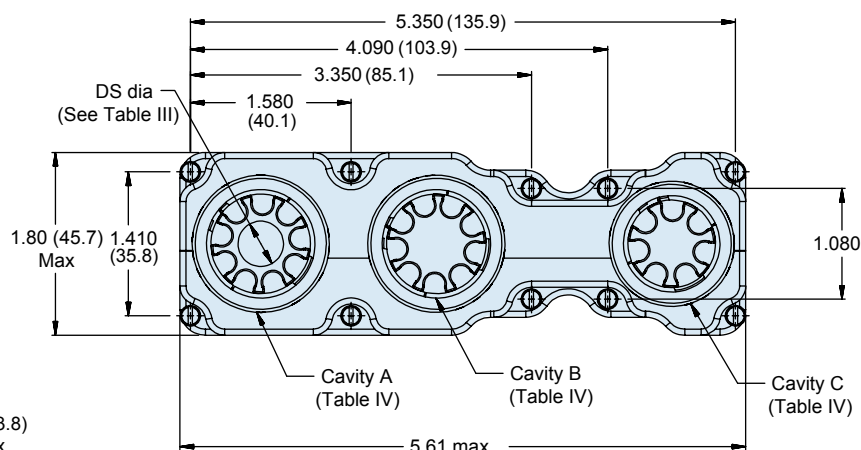
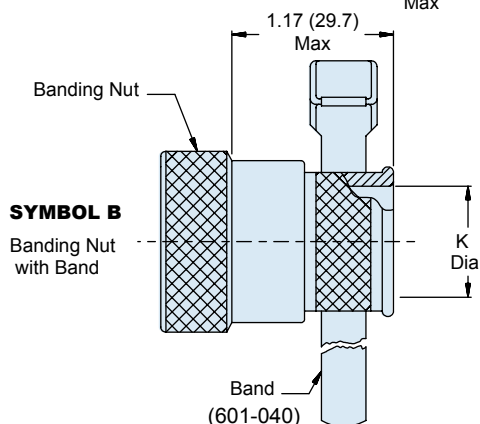
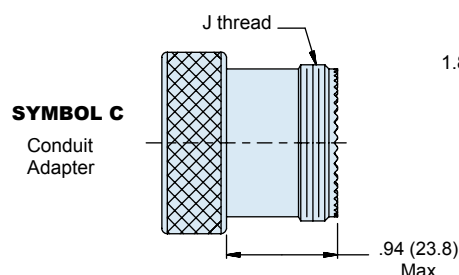
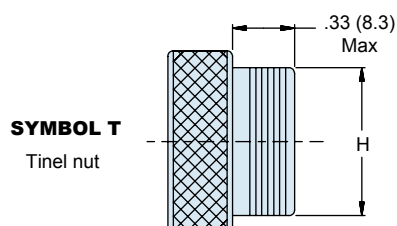
**Rear End
Options**



**High
Ferrule Count**

StarShield™ non-environmental, high ferrule count, backshell assembly with rear end options

Product Series	Finish Code (See Table II)	Backend Styles (See Table IV)	Backend Styles (See Table IV)	Backend Styles (See Table IV)
527 - 449	NF	09	G 09	G 07
				G DS
Basic Number	Ferrule Quantity Code (See Table I - Cavity A)	Ferrule Quantity Code (See Table I - Cavity B)	Ferrule Quantity Code (See Table I - Cavity C)	Drilled Star <i>DS - Optional</i> (Omit if not required) (See Table III) (See Note 4)



Dimensions in inches (millimeters) and are subject to change without notice.

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527-449
StarShield™ EMI/RFI Backshell Assembly
for size 2 ARINC 600 series connector



Table I: Dimensions

Cavity	Ferrule Quantity Code			H ±.003	J Thread ISO Metric	K ±.004	Cable Range	
							Min	Max
A & B	00	09	11 (See note 5)	1.245 (31.6)	M31 X 1 - 6g	1.063 (27.0)	.687 (17.4)	.875 (22.2)
C	00	07		1.121 (28.5)	M28 X 1 - 6g	.945 (24.0)	.562 (14.3)	.750 (19.1)

Table II: Material and Finish Options

Code	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
Z1	Stainless steel; passivate
ZM	Stainless steel; electroless nickel

Table III: Drilled Star Options

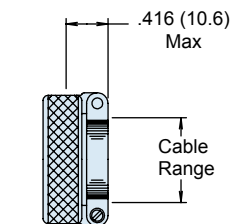
Ferrule Quantity	DS Dia Max (See note 4)
7	.35 (8.9)
9	.47 (11.9)

Table IV: Backend Styles

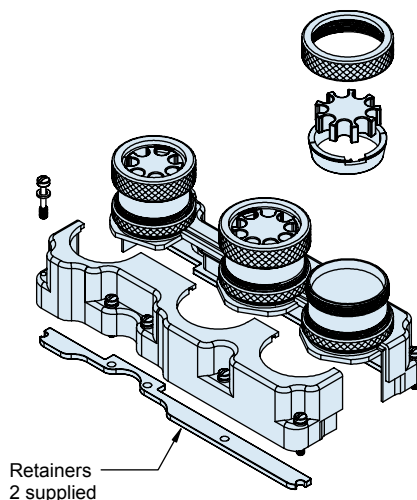
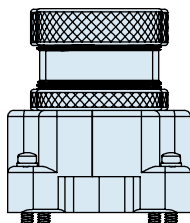
Symbol	Description
B	Banding nut with band
C	Conduit adapter
F	Light duty cable clamp (see note 6)
G	Gland nut
P	Plug cover (see note 6)
T	Tinel nut with tinell ring for single braid

Material/Finish

Backshell, adapters, nuts, backend styles (Table IV), compression rings, retainers, stars	Al alloy/see Table II
Hardware	CRES/passivate



SYMBOL F
Light Wt. Clamp



Notes:

1. Assembly identified with manufacturer's name and P/N, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Drilled star option is not available for stars that hold 11 ferrules.
5. 11 ferrule star is composed of a split 8 ferrule star and a 3 ferrule star.
6. When ordering Type F clamp use 00 for ferrule quantity code. Compression rings and star are not supplied.
7. Ferrule kit sold separately.
687-764 ferrule and HST device kit
687-809 ferrule and sealing device kit
687-748 solder ferrule
687-841-01 HST flex device
8. Shrink boot ref. Part number 770-001S108.

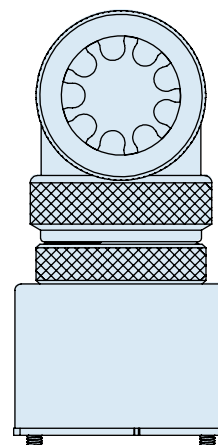
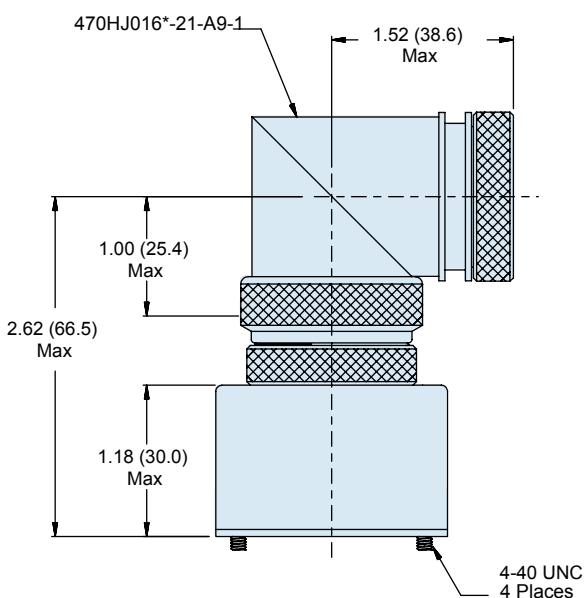
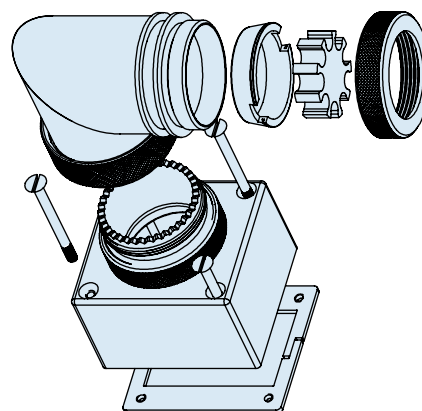
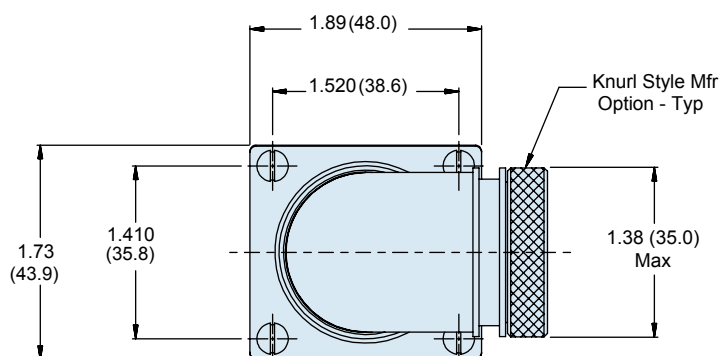
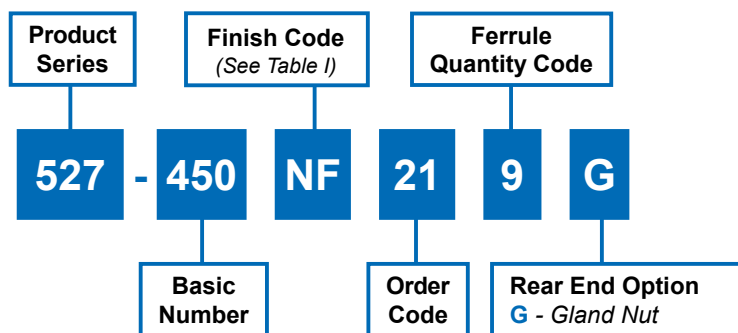
Dimensions in inches (millimeters) and are subject to change without notice.



527-450
StarShield™ EMI/RFI Shield Termination
Backshell Assembly
For Collins SGA3 Connector



StarShield™ shield termination backshell with banding porch



Dimensions in inches (millimeters) and are subject to change without notice.

527-450
StarShield™ EMI/RFI Shield Termination
Backshell Assembly
For Collins SGA3 Connector



Table II: Material and Finish Options

Code	Material; Finish Description
M	Aluminum; electroless nickel
MT	Aluminum; nickel - PTFE
NF	Aluminum; CAD/O. D. over electroless nickel
ZN	Aluminum; zinc nickel/O. D. over electroless nickel
ZR	Aluminum; zinc nickel/black over electroless nickel (RoHS)
Z1	Stainless steel; passivate
ZM	Stainless steel; electroless nickel

Material/Finish

Backshell, adapter, elbow, nut, coupling & gland nut, compression ring, clips, star	Al alloy/see Table I
Hardware	CRES/passivate

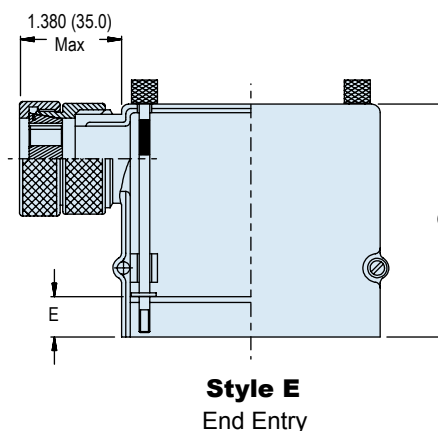
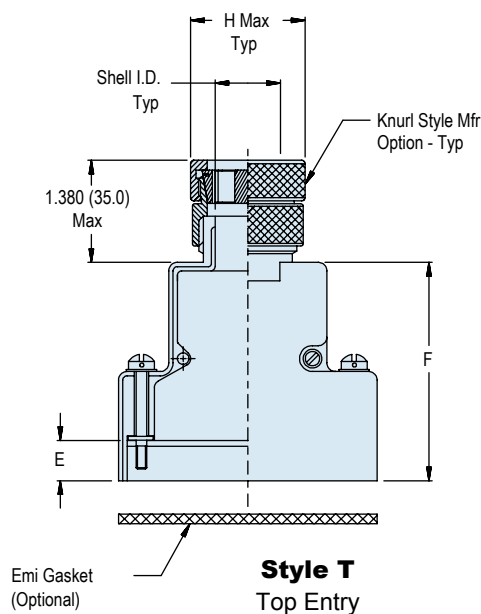
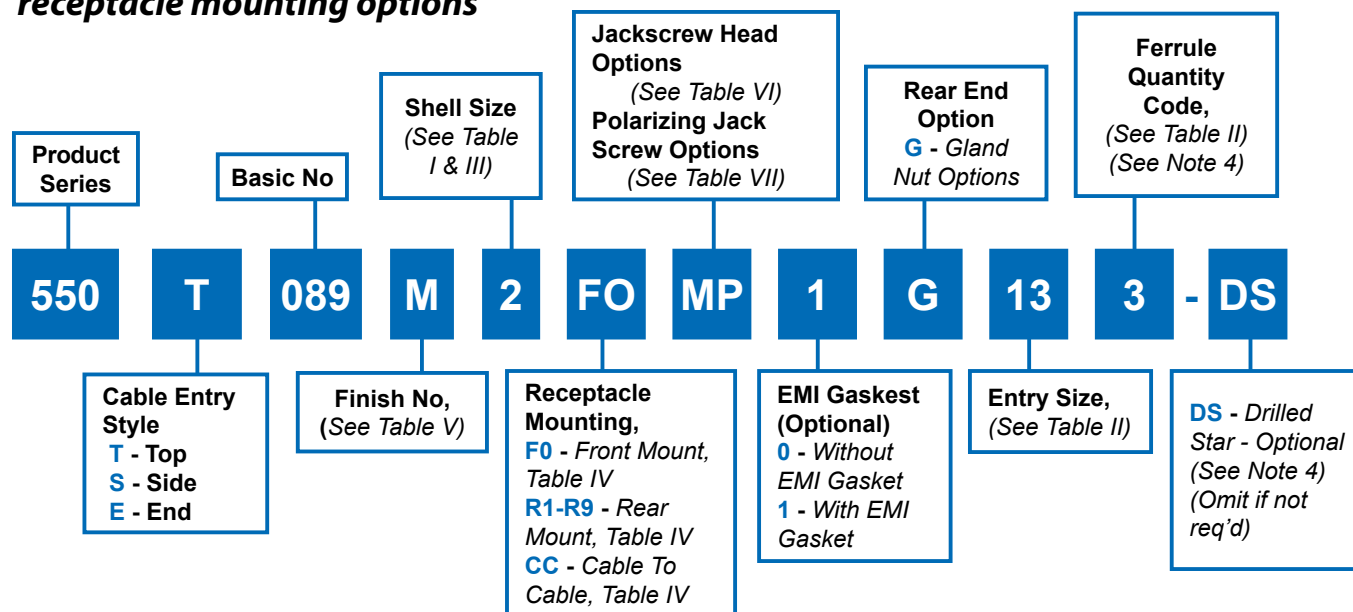
1. Assembly identified with manufacturer's name and P/N, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Ferrule kit sold separately.
 687-764 ferrule and HST device kit
 687-809 ferrule and sealing device kit
 687-748 solder ferrule
 687-841-01 HST flex device



550-089
StarShield™ EMI/RFI Shield Termination
Backshell Assembly
for MIL-DTL-24308 D-Subminiature



StarShield™ non-environmental shield termination backshell with cable entry and receptacle mounting options



Dimensions in inches (millimeters) and are subject to change without notice.

550-089
**StarShield™ EMI/RFI Shield Termination
 Backshell Assembly**
 for MIL-DTL-24308 D-Subminiature



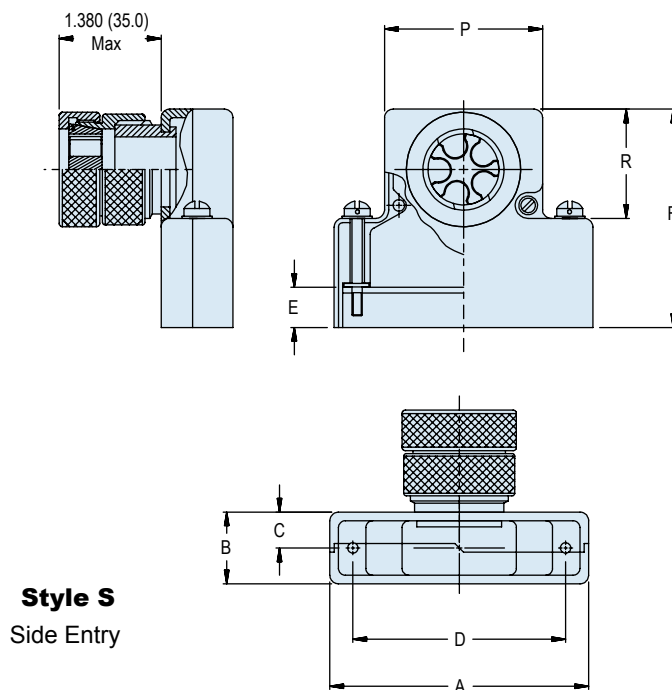
Table I: Dimensions

Shell Size	Com'l Shell Size Ref	Entry Style T Shell I.D.	Entry Style E Shell I.D.	Max Entry
1	E/09	0.250 (6.40)	0.375 (9.50)	13
2	A/15	0.375 (9.50)	0.375 (9.50)	15
3	B/25	0.475 (12.10)	0.475 (12.10)	17
4	C/37	0.475 (12.10)	0.475 (12.10)	21
5	D/50	0.575 (14.60)	0.575 (14.60)	21
6*	F/104	1.000 (25.40)	1.000 (25.40)	23

* Shell size 6 available in top and end entry only.

Table II: Ferrule Quantity

Entry Size	H Dia Max	Ferrule Quantity (See Note 4)	
		Std.	Opt.
9	0.69 (17.50)	1	-
11	0.85 (21.50)	2	-
13	0.89 (22.50)	3	-
15	1.00 (25.50)	5	-
17	1.12 (28.50)	6	7
19	1.24 (31.50)	7	-
21	1.38 (35.00)	9	11
23	1.50 (38.00)	10	13



Notes:

1. Assembly identified with manufacturer's name and p/n, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Star not supplied with entry size 09. Drilled star is available on entry sizes 15-23 only. If optional ferrule qty per Table II is selected, one split and one solid star will be supplied
5. Ferrules sold separately.

Material/finish:

6. Adapter, backshell, gland nut, compression ring, star - Al alloy/see Table V
7. Hardware - cres/passivate
8. Gasket - metex/n.a.
9. Washer - nylon/n.a.

Dimensions in inches (millimeters) and are subject to change without notice.



550-089

StarShield™ EMI/RFI Shield Termination Backshell for MIL-DTL-24308 D-Subminiature

Table III: Common Backshell Dimensions

Shell Size	Com'l Shell Size Ref	A Max	B Max	C Ref	D $\pm .005(.1)$	P	R Ref
1	E/09	1.393 (35.40)	0.624 (15.80)	0.312 (7.90)	0.984 (25.00)	0.730 (18.50)	0.719 (18.30)
2	A/15	1.706 (43.30)	0.624 (15.80)	0.312 (7.90)	1.312 (33.30)	1.050 (26.70)	0.719 (18.30)
3	B/25	2.265 (57.50)	0.624 (15.80)	0.312 (7.90)	1.852 (47.00)	1.594 (40.50)	0.938 (23.80)
4	C/37	2.900 (73.70)	0.624 (15.80)	0.312 (7.90)	2.500 (63.50)	2.240 (56.90)	0.938 (23.80)
5	D/50	2.800 (71.10)	0.750 (19.10)	0.375 (9.50)	2.406 (61.10)	2.140 (54.40)	0.938 (23.80)
6	F/104	2.900 (73.70)	0.844 (21.40)	0.422 (10.70)	2.500 (63.50)	2.240 (56.90)	1.094 (27.80)

Table IV : Cable Mounting Dimensions

Dash No	Panel Thickness	E	F $\pm .031$			G $\pm .031$	
			Size 1 & 2	Size 3 - 5	Size 6	Size 1 & 2	Size 3 - 6
CC	N/A	0.174 (4.40)	1.451 (36.90)	1.671 (42.40)	1.820 (46.20)	1.583 (40.20)	1.831 (46.70)
F0	N/A	0.343 (8.70)	1.625 (41.30)	1.844 (46.80)	2.000 (50.80)	1.750 (44.50)	2.000 (50.80)
R1	0.031 (0.80)	0.247 (6.30)	1.525 (38.70)	1.745 (44.30)	1.890 (48.00)	1.656 (42.10)	1.904 (48.40)
R2	0.047 (1.20)	0.231 (5.90)	1.509 (38.30)	1.728 (43.90)	1.875 (47.60)	1.640 (41.70)	1.888 (48.00)
R3	0.062 (1.60)	0.216 (5.50)	1.500 (38.10)	1.720 (43.70)	1.860 (47.20)	1.625 (41.30)	1.873 (47.60)
R4	0.093 (2.40)	0.185 (4.70)	1.470 (37.30)	1.690 (42.90)	1.829 (46.50)	1.594 (40.50)	1.842 (46.80)
R5	0.104 (2.60)	0.174 (4.40)	1.451 (36.90)	1.671 (42.40)	1.820 (46.20)	1.583 (40.20)	1.831 (46.50)
R6	0.125 (3.20)	0.153 (3.90)	1.430 (36.30)	1.650 (41.90)	1.798 (45.70)	1.563 (39.70)	1.811 (46.00)
R7	0.156 (4.00)	0.125 (3.20)	1.400 (35.60)	1.620 (41.10)	1.767 (44.90)	1.531 (38.90)	1.781 (45.20)
R8	0.135 (3.40)	0.140 (3.60)	1.417 (36.00)	1.637 (41.60)	1.805 (45.80)	1.550 (39.40)	1.798 (45.70)
R9	0.188 (4.80)	0.094 (2.40)	1.368 (34.70)	1.590 (40.60)	1.740 (44.20)	1.500 (38.10)	1.750 (44.50)

Table V: Finish Description

Sym	Finish Description
A	Cadmium/bright dip
B	Cadmium plate/olive drab
E	Iridite/gold
J	Gold iridite over cadmium plate over nickel
M	Electroless nickel
MB	Electroless nickel matte finish
N	Cadmium plate/olive drab over nickel
NC	Zinc cobalt with/olive drab chromate
NF	Cad/o.d. Over electroless nickel (1000 hour salt spray)"
T	Cadmium plate/bright dip over nickel
Y	Gold iridite over cadmium plate

Table VI: Male Jackscrew Head Options

Style T and S	Style T and S	Style T and S	Style T and S	Style T and S	E Style
Type A Socket Head	Type B Fillister Head	Type D Drilled Fillister Head	Type H Hex Head	Type K Knurl Slotted Head	Type J Knurled Slotted Head

Dimensions in inches (millimeters) and are subject to change without notice.

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StarShield™ Zero Length Shield Termination Catalog

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B-46

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550-089
StarShield™ EMI/RFI Shield Termination Backshell
 for MIL-DTL-24308 D-Subminiature



StarShield™
Backshells

Table VII: Polarizing Jackscrew Options

Type EF Extended Turnable - Male & Female	Type EL Extended Turnable Females	Type F Turnable Male & Female
Type L Turnable Females	Type M Turnable Males	Type E Extended Turnable Males
Type N Fixed Male & Female	Type P Fixed Females	Type R Fixed Males
Type MP Turnable Male & Fixed Female		

B

STARSHIELD™ AND SWING ARM™ – A WINNING COMBINATION

FOR EMI/RFI PROTECTION AND FLEXIBLE CABLE ROUTING

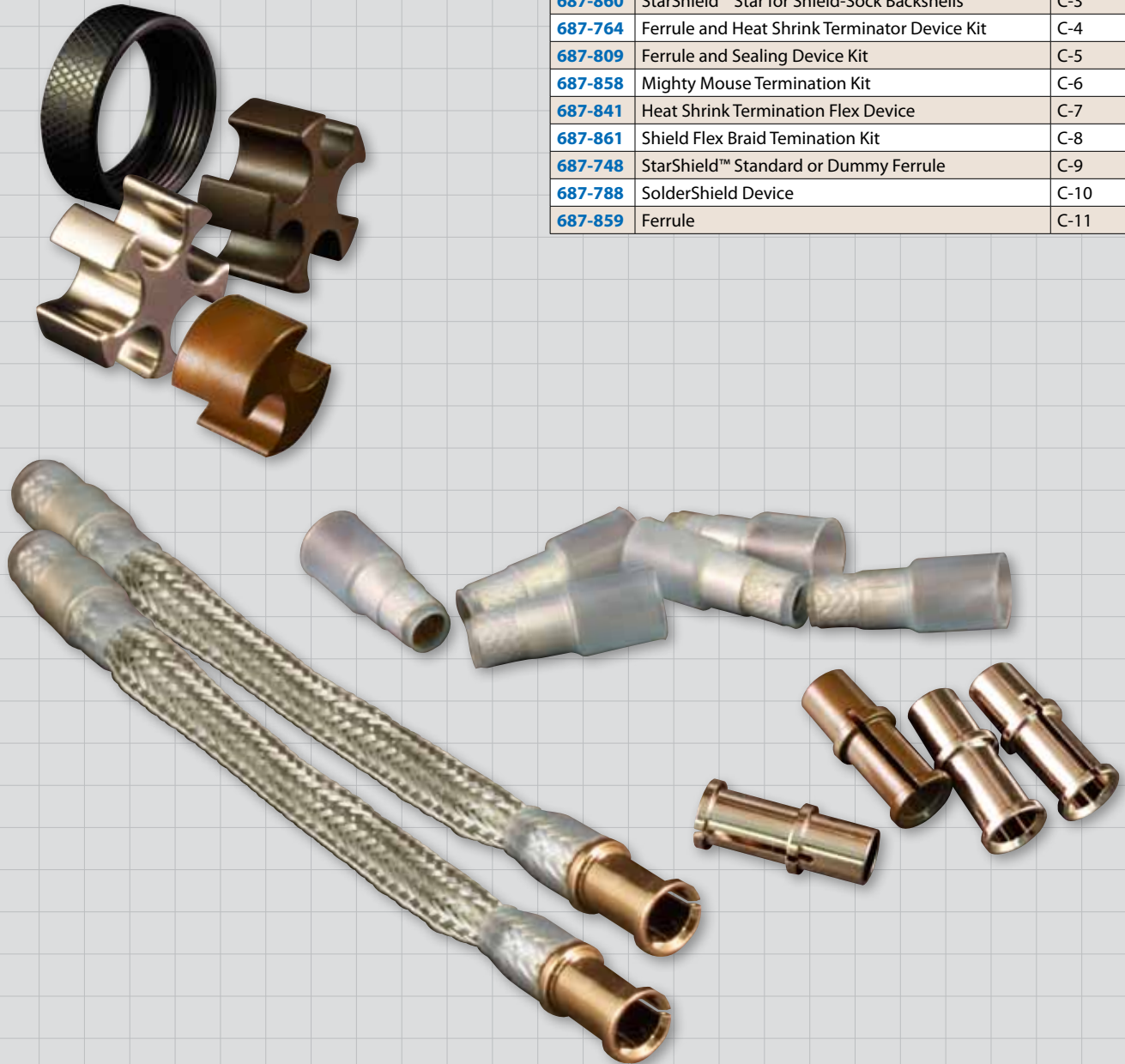
StarShield™ dramatically reduces EMI/RFI distortion and maintains signal integrity by eliminating standing antennas created in the EMI shield termination process. Swing Arm™ is a revolutionary cable clamp and backshell design that allows multiple cable routing configurations in a single part. By marrying the shielding properties of StarShield™ to the versatility and ease-of-use of the Swing Arm™, Glenair delivers the ultimate in versatility and performance: Swing Arm™ reduces SKU's and complexity in cable harness design, and StarShield™ delivers unrivaled performance in EMI/RFI shield termination. And as always, Glenair delivers the premier customer service and technical support you depend on in a key supplier. Our engineering team is the best (and biggest) in the industry. And we offer same-day delivery on thousands of popular part numbers and unmatched capacity for volume production. For more information on Glenair "Out of this World Interconnect Solutions," please call or visit our factory, or see us online at www.glenair.com.



StarShield™ Components General Information



StarShield™ zero length termination components - Replacement parts and accessories



Part No.	Description	Page No.
687-763	StarShield™ "Star"	C-2
687-860	StarShield™ Star for Shield-Sock Backshells	C-3
687-764	Ferrule and Heat Shrink Terminator Device Kit	C-4
687-809	Ferrule and Sealing Device Kit	C-5
687-858	Mighty Mouse Termination Kit	C-6
687-841	Heat Shrink Termination Flex Device	C-7
687-861	Shield Flex Braid Termination Kit	C-8
687-748	StarShield™ Standard or Dummy Ferrule	C-9
687-788	SolderShield Device	C-10
687-859	Ferrule	C-11

Dimensions in inches (millimeters) and are subject to change without notice.



687-763 StarShield™ “Star” for StarShield™ Backshells

StarShield™ “Star”

Table I				
Order No.	Shell/Entry Size (See note 3)	A Dia Max	No. of Cavities	Style
11	10/11	-	2	1
13	12/13	-	3	
15	14/15	.118 (3)	5	
17	16/17	.236 (6)	6	
19	18/19	.354 (9)	7	
21	20/21	.472 (12)	9	
218	20/21	.472 (12)	8	
23	22/23	.591 (15)	10	
25	24/25	.708 (18)	12	
2914	28/29	.979 (25)	14	
3318	32/33	1.097 (28)	18	2
177	16/17	-	7	
2111	20/21	-	11	
2313	22/23	-	13	
2514	24/25	-	14	
2515	24/25	-	15	
2517	24/25	-	17	
2922	28/29	-	22	
2925	28/29	-	25	
3328	32/33	-	28	
3331	32/33	-	31	

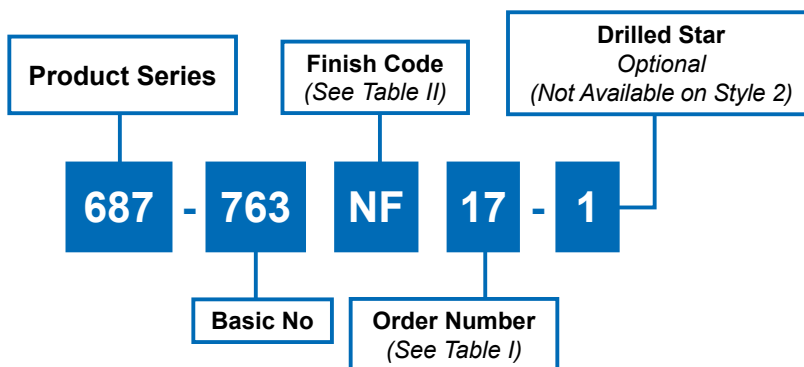
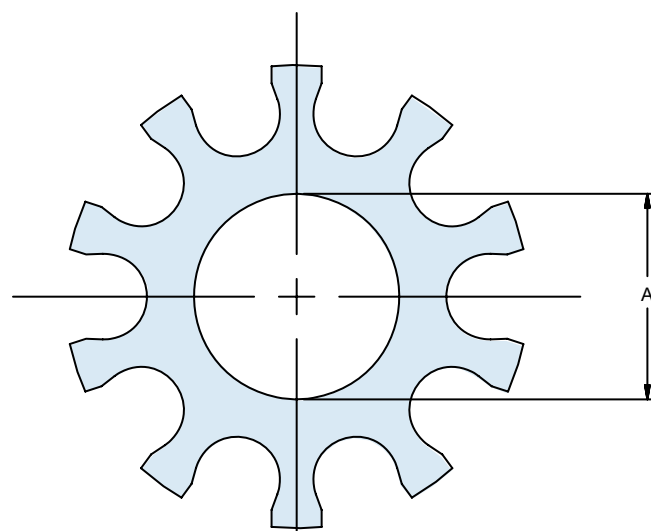


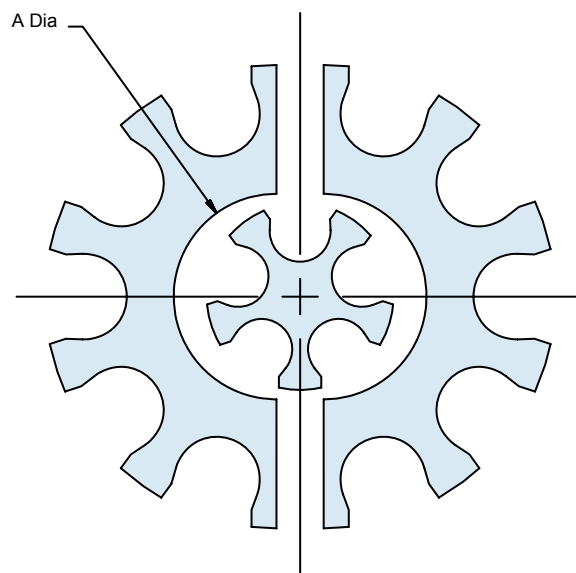
Table II	
Code	Finish Description
M	Electroless nickel
NF	Cad/O. D. Over electroless nickel (1000 hour salt spray)
Z1	Stainless steel/passivate
ZR	Aluminum/zinc-nickel, black
ZM	Stainless steel/ electroless nickel

Notes:

1. Assembly to be bagged and tagged with manufacturer's name and part number.
2. Material/finish: Al alloy or CRES/see Table I
3. Shell size shall be used for 470-013.
Entry size shall be used for 470-019/020.



STYLE 1
Single Solid Star



STYLE 2
Split Outer Star and
Solid Inner Star

Dimensions in inches (millimeters) and are subject to change without notice.

687-860
StarShield™ “Star”
for StarShield™ Shield-Sock Backshells



StarShield™
Components

StarShield™ “Star” for Shield Sock backshells

Table I

No. Of Cavities	Style	A Dia	B Dia Max	C Dia Max	D Dia Max
3	1	-	.643(16.3)	-	-
4	1	-	.726(18.4)	-	-
5	1	.141(3.6)	.818(20.8)	-	-
6	1	.240(6.1)	.913(23.2)	-	-
7	1	.335(8.5)	1.010(25.7)	-	-
8	1	.385(9.8)	1.109(28.2)	-	-
9	1	.533(13.5)	1.208(30.7)	-	-
10	1	.633(16.1)	1.307(33.2)	-	-
14	2	-	1.470(37.3)	.798(20.3)	-
15	2	.141(3.6)	1.476(37.5)	.890(22.6)	-
18	2	.240(6.1)	1.570(39.9)	.985(25.0)	-
19	2	.330(8.4)	1.670(42.4)	1.081(27.5)	-
20	2	.385(9.8)	1.741(44.2)	1.181(30.0)	-
25	3	-	1.957(49.7)	1.374(34.9)	.715(18.2)
30	3	-	2.038(51.8)	1.456(37.0)	.788(20.0)

Product Series

Finish Code
(See Table II)

687

- 860

M

10

Basic No

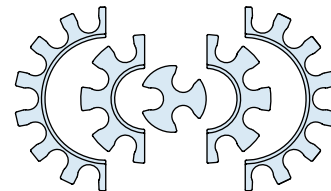
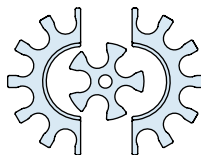
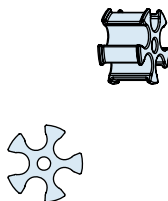
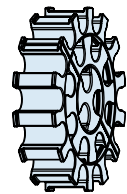
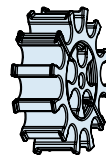
Number of Cavities
(See Table I)

Notes:

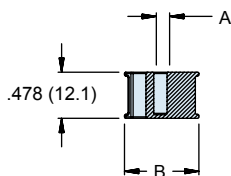
1. Assembly to be bagged and tagged with manufacturer's name and part number.
2. Used with 687-859/861.
3. Material/Finish: Al alloy or CRES/see Table I

Table II

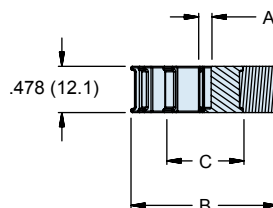
Code	Finish Description
M	Electroless nickel
NF	Cad/O. D. Over electroless nickel (1000 hour salt spray)
ZM	Stainless steel/ electroless nickel
ZR	Aluminum/zinc-nickel, black



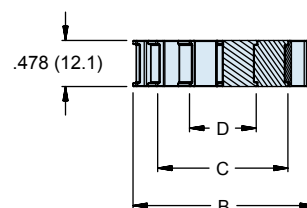
C



STYLE 1
(Single Solid Star)



STYLE 2
(Split Outer Star and
Solid Inner Star)



STYLE 3
(2 Split Outer Stars and
Solid Inner Star)

Dimensions in inches (millimeters) and are subject to change without notice.

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687-764

Ferrule and Heat Shrink Terminator Device Kit for StarShield™ Backshells

Ferrule and heat shrink terminator device kit

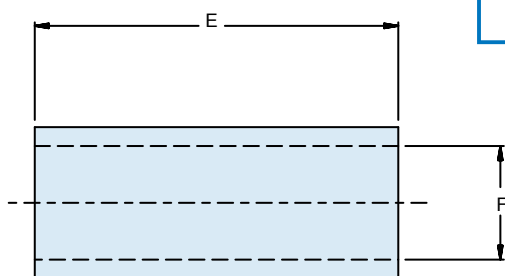
Product
SeriesSize
(See Table I)

687

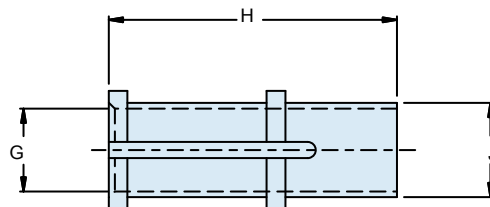
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02

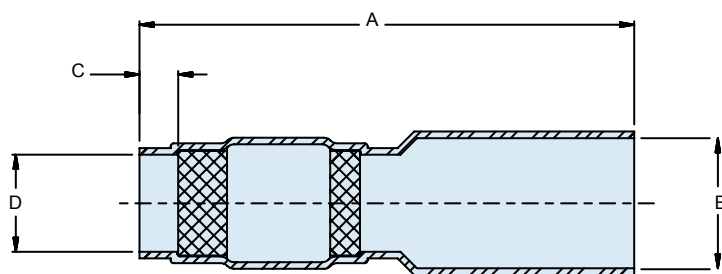
M

Basic
NumberFinish Code
(See Table II)

INSULATION SLEEVE



FERRULE



HEAT SHRINK TERMINATOR (HST) DEVICE

Material/Finish

Ferrule	Copper alloy/see Table II
Insulation sleeve	Heat-shrinkable, radiation cross-linked modified polyvinylidene fluoride
Radiation cross-linked modified polyvinylidene fluoride HST Device:	
Heat shrinkable insulation sleeve.	Radiation cross-linked modified polyvinylidene fluoride
Aarmorlite or copper braid	Pre-tinned with Sn96Ag3.5Cu.5 solder alloy with activated rosin flux.
Solder preform	Sn96Ag3.5Cu.5 solder alloy with activated rosin flux.

Table I

Order No.	A Dia Max	B Dia Min	C Max	D Dia Min	E Min	F Dia Min	G Dia Min	H Max	J Ref
02	1.045 (26.5)	.275 (7.00)	.080 (2.0)	.205 (5.2)	.768 (19.5)	.240 (6.1)	.170 (4.3)	.620 (15.7)	.200 (5.1)
04	1.181 (30.0)	.354 (9.00)	.098 (2.5)	.205 (5.2)	.768 (19.5)	.240 (6.1)	.170 (4.3)	.620 (15.7)	.200 (5.1)
05	1.850 (47.0)	.475 (12.07)	.118 (3.0)	.362 (9.5)	1.000 (25.4)	.370 (9.4)	.300 (7.6)	1.004 (25.5)	.354 (9.0)

Table II

Code	Finish Description
M	Electroless nickel
NF	CAD/O. D. Over electroless nickel (1000 Hour salt spray)
ZRC	Aluminum/zinc-nickel

Notes:

1. Identified by bag and tag in suitable quantities.
2. The Ferrule and the HST Device are used on Glenair StarShield™ adapters.
3. Temperature range: -65°C to +175°C

Dimensions in inches (millimeters) and are subject to change without notice.

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C-4

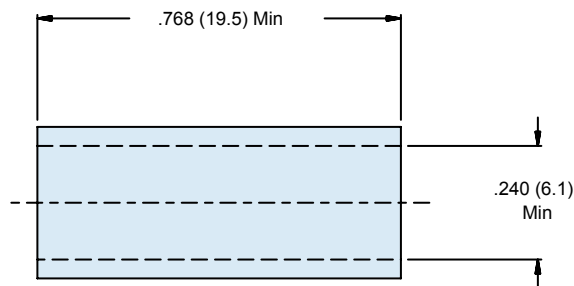
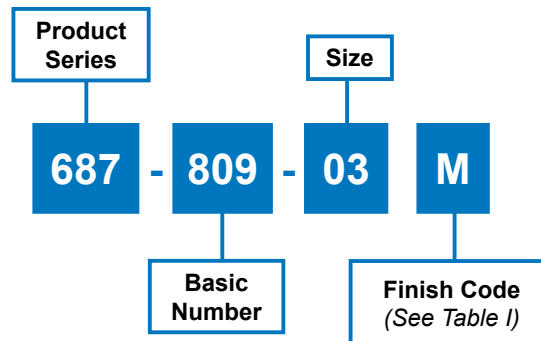
E-Mail: sales@glenair.com

687-809
Ferrule and Sealing Device Kit
for StarShield™ Backshells



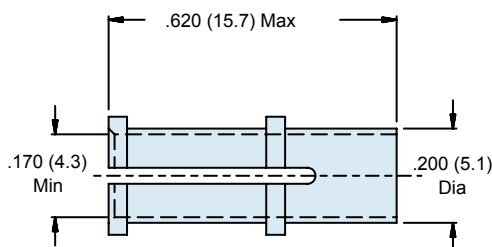
StarShield™
Components

Ferrule and sealing device kit

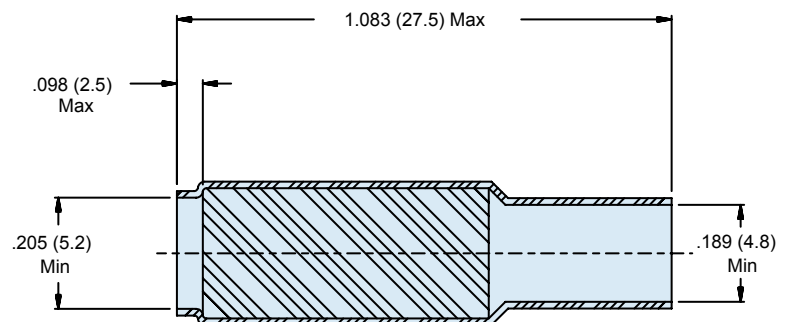


INSULATION SLEEVE

Table I	
Code	Finish Description
M	Electroless Nickel
NF	CAD/O.D. Over Electroless Nickel (1000 Hour Salt Spray)
ZRC	Aluminum/zinc-nickel



FERRULE



SEALING DEVICE

Material/Finish:	
Ferrule	Copper alloy/see Table I
Insulation Sleeve	Heat-shrinkable, radiation cross-linked modified polyvinylidene fluoride.
Sealing Device	Heat shrinkable insulation sleeve (radiation cross-linked modified polyvinylidene fluoride).

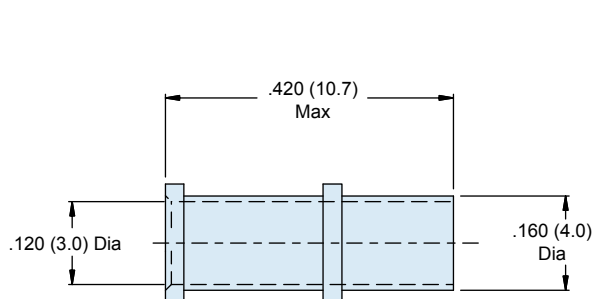
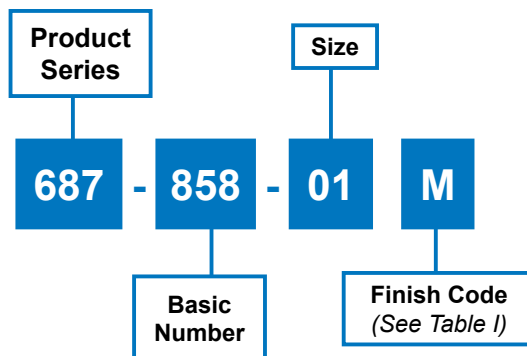
Notes:

1. Identified by bag and tag in suitable quantities.
2. The ferrule and sealing device are used on Glenair StarShield™ Backshells.
3. Temperature range: -65°C to +175°C.

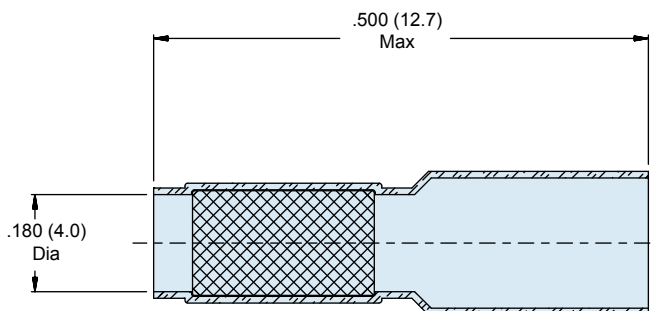


687-858 Mighty Mouse Termination Kit for StarShield™ Backshells

Mighty Mouse Termination Kit



FERRULE



HEAT SHRINK TERMINATOR (HST) DEVICE

Table I

Code	Finish Description
M	Electroless nickel
NF	CAD/O. D. over electroless nickel (1000 hour salt spray)
ZRC	Aluminum/zinc-nickel

Material/Finish:

Ferrule	Al Alloy/See Table I
Heat Shrinkable Sleeve (HST) Device	Radiation Cross-Linked Modified Polyvinylidene Fluoride

Notes:

1. Identified by bag and tag in suitable quantities.
2. The ferrule and the hst device are used on Glenair StarShield™ backshells for Mighty Mouse connectors 470MS021.
3. Temperature range: -65°C to +175°C.

Dimensions in inches (millimeters) and are subject to change without notice.

687-841 Heat Shrink Termination Flex Device for StarShield™ Backshells



StarShield™
Components

HST-flex device

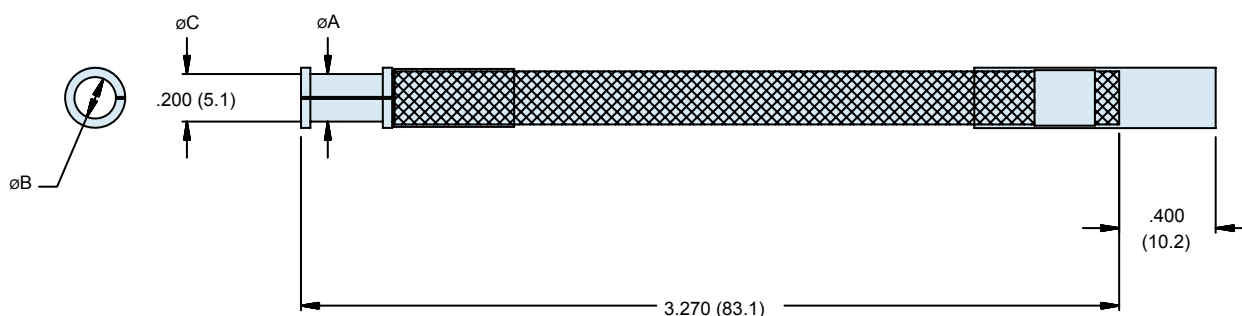
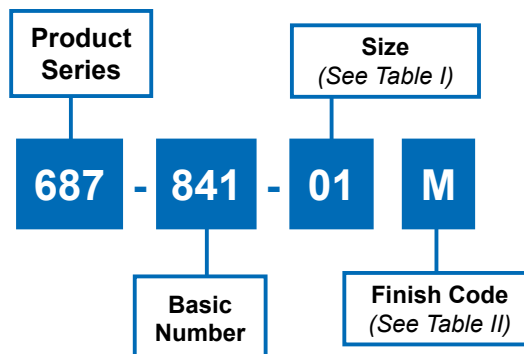
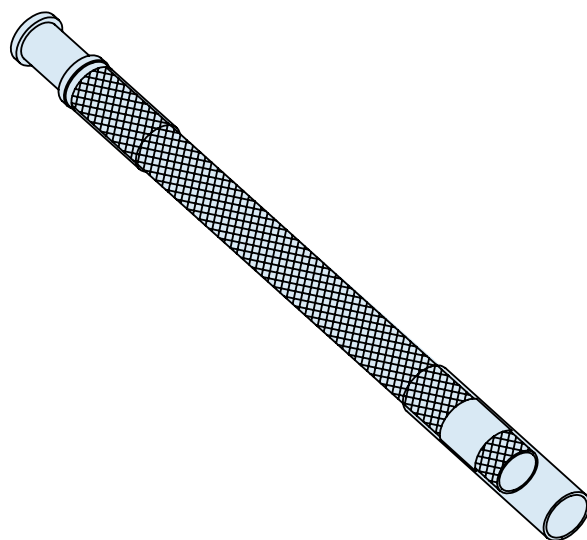


Table I			
Size	ø A	ø B	ø C
01	.200 (5.1)	.172 (4.4)	.25 (6.4)
02	.230 (5.8)	.204 (5.2)	.27 (6.9)

Table II	
Code	Finish Description
M	Electroless nickel
NF	CAD/O. D. over electroless nickel (1000 hour salt spray)

Material/Finish	
Ferrule	Copper alloy/see Table I
Heat-shrinkable radiation cross-linked polyvinylidene fluoride HST Device:	
Heat Shrinkable Insulation Sleeve	Radiation cross-linked modified polyvinylidene fluoride
Solder Preform	Sn96Ag3.5Cu.5 solder alloy with activated rosin flux
Braid	ArmorLite™

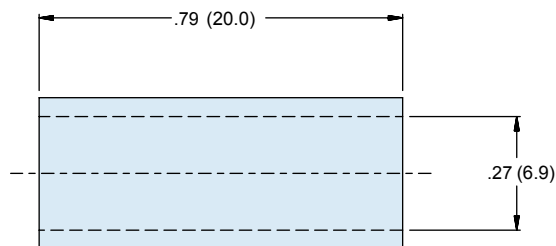
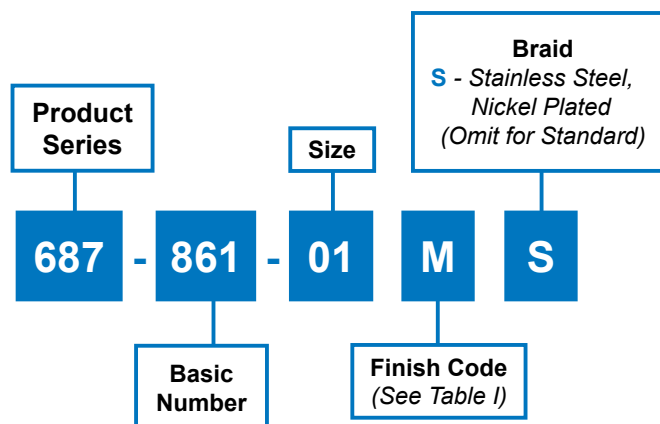
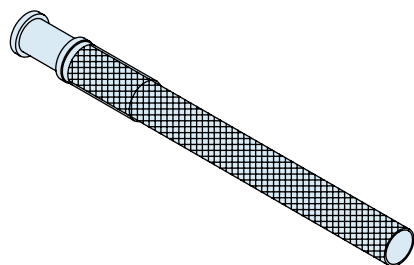
Notes:

1. Identified by bag and tag in suitable quantities.
2. The HST-Flex Device is used on Glenair StarShield™ Adapters.
3. Temperature range: -65°C to +175°C.

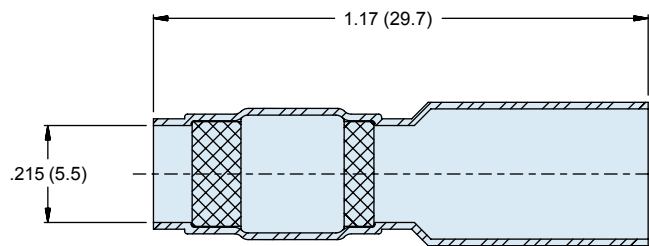


687-861 Shield Flex Braid Termination Kit for Glenair StarShield™ Shield-Sock Termination

Shield flex braid termination kit



INSULATION SLEEVE



HEAT SHRINK TERMINATOR (HST) DEVICE

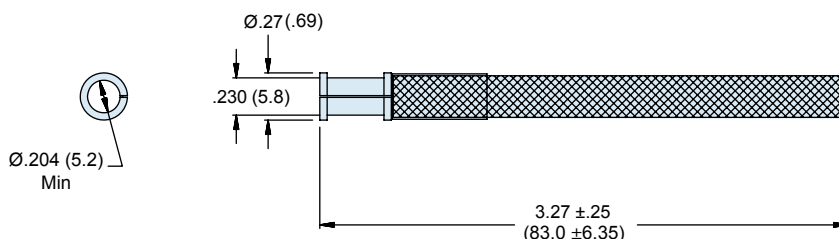


Table I	
Code	Finish Description
M	Electroless nickel
NF	CAD/O. D. over electroless nickel (1000 hour salt spray)
ZRC	Aluminum/zinc-nickel

Notes

1. Identified by bag and tag in suitable quantities.
2. HST-flex device are used on Glenair StarShield™ Backshells.
3. Temperature range: -55°C to +200°C.

Material/Finish	
Ferrule	Copper alloy/see Table I
Heat-shrinkable radiation cross-linked polyvinylidene fluoride HST Device:	
Heat Shrinkable Insulation Sleeve	Radiation cross-linked modified polyvinylidene fluoride
Solder Preform	Sn96Ag3.5Cu.5 solder alloy with activated rosin flux
Silver Plated Copper Per AA 59569 Form R. Strand Coating S	

Dimensions in inches (millimeters) and are subject to change without notice.

687-748
StarShield™ Standard or Dummy Ferrule



StarShield™
Components

StarShield™ ferrule - standard or dummy

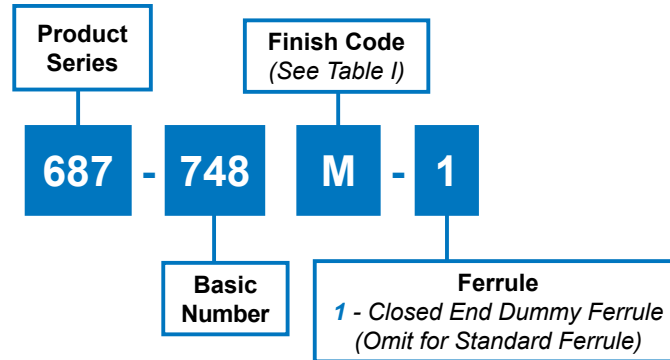
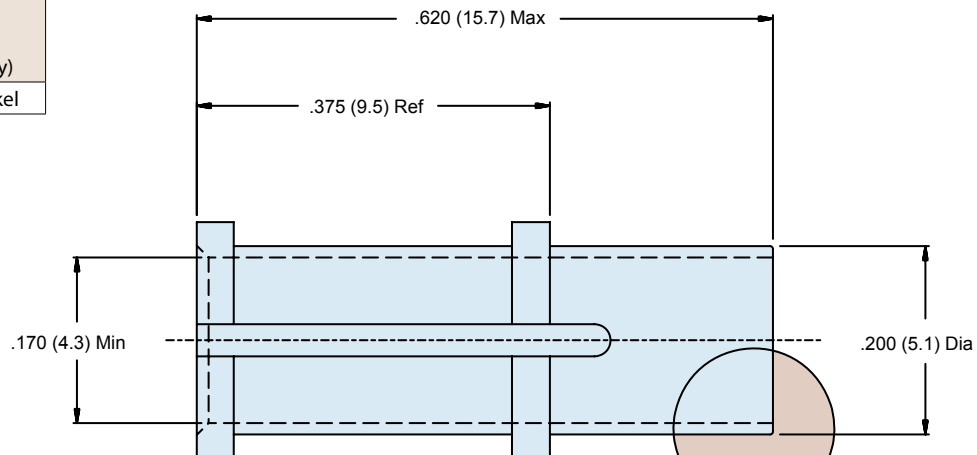


Table I	
Code	Finish Description
M	Electroless Nickel
NF	CAD/O.D. over electroless nickel (1000 hour salt spray)
ZRC	Aluminum/zinc-nickel

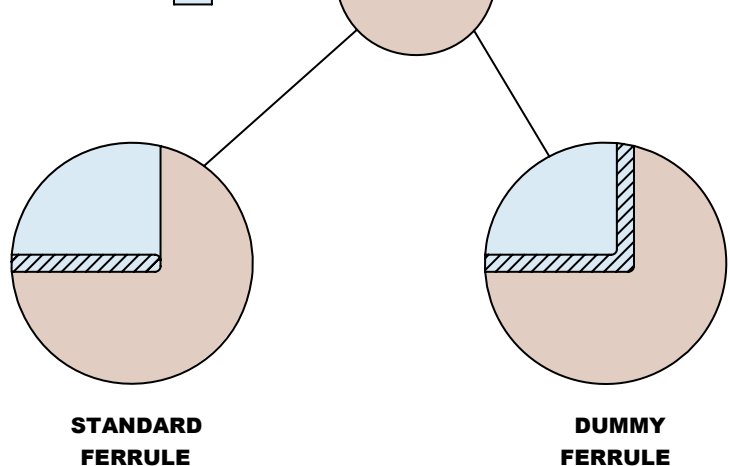


Notes:

1. Identified by bag and tag in suitable quantities.
2. Solder tube used with Glenair backshells.

Material/Finish:

3. Copper alloy/see Table I



**STANDARD
FERRULE**

**DUMMY
FERRULE**

Dimensions in inches (millimeters) and are subject to change without notice.

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687-788 SolderShield Device for StarShield™ Backshells

SolderShield device

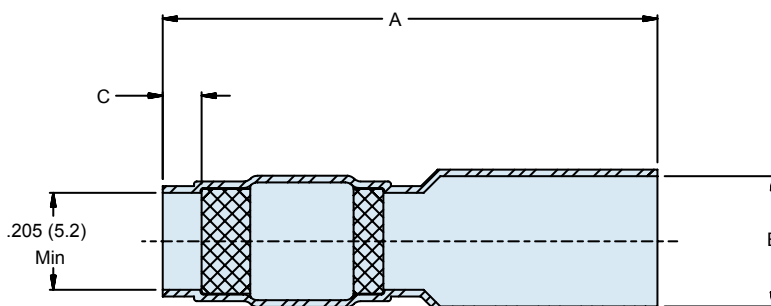
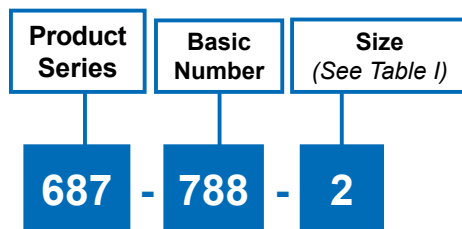


Table I

Size	A Dia Max	B Dia	C Max
02	1.045 (26.5)	.275 (7.00)	.080 (2.0)
04	1.181 (30.0)	.354 (9.00)	.098 (2.5)

Material/Finish:

Solder Shield Device:

Heat shrinkable insulation sleeve	Radiation cross-linked modified polyvinylidene fluoride
ArmorLite or Copper Braid	Pre-tinned with Sn9Ag3.5Cu.5 solder alloy with activated rosin flux
Solder Preform	Sn9Ag3.5Cu.5 solder alloy with mildly activated rosin flux

Notes:

1. Identified by bag and tag in suitable quantities.
2. The SolderShield Device is used on Glenair StarShield™ backshells.
3. Temperature range: -65°C to +175°C

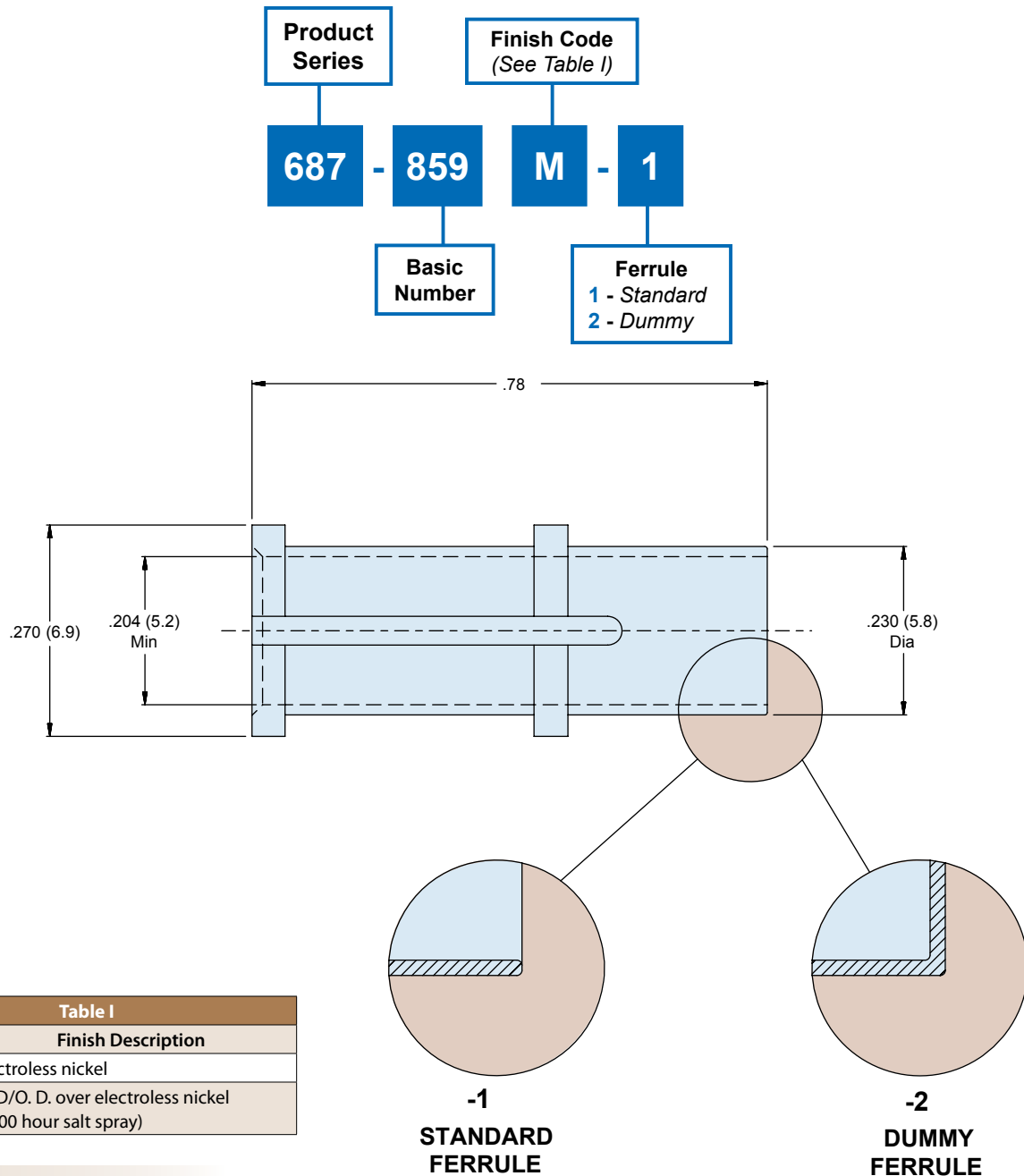
Dimensions in inches (millimeters) and are subject to change without notice.

687-859
Ferrule
for StarShield™ Shield-Sock Termination



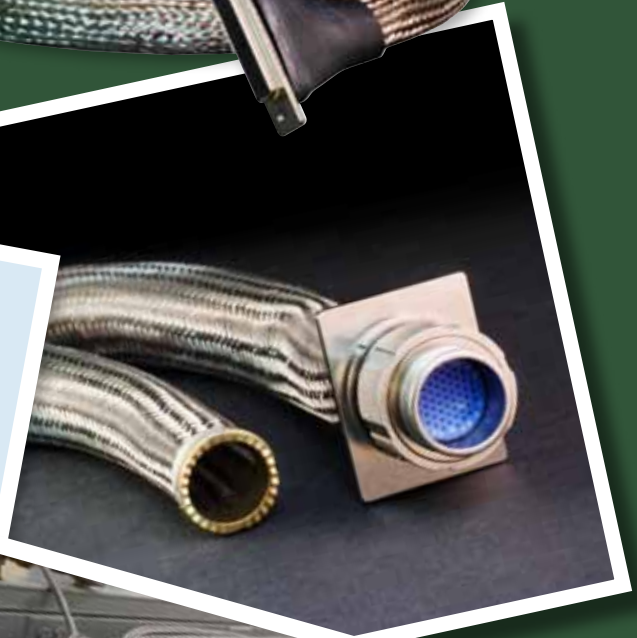
StarShield™
Components

Ferrule



ARMORLITE™

THE SMART WAY TO REDUCE LAUNCH AND FLIGHT WEIGHTS MICROFILAMENT NICKEL CLAD STAINLESS STEEL BRAID



- Microfilament stainless steel: 70% lighter than NiCu A-A-59569
- Outstanding EMI/RFI shielding and conductivity
- Reduce shielding weight up to 70% and more
- Superior flexibility and "windowing resistance"



Series 77 Shrink Boots

Lipped Straight Adapter Shrink Boots

General Information



Lipped Straight Adapter Shrink Boots, Standard



StarShield™ Zero Length Shield Termination Backshells are equipped with boot grooves for the utilization of standard Glenair environmental lipped shrinkboots. After shrinking, the boot lip locks into the StarShield™ adapter groove. Eyelet hole allows attachment of dust caps or protective covers. Type 1 high performance elastomer boots for extreme temperatures and excellent resistance to fuels and oils, may be specified by adding a -T modifier to the StarShield™ part number. Choose boot size based on the tables provided on each StarShield™ catalog page.

- Easy attachment to StarShield™ backshell shrink boot adapters
- With or without eyelets

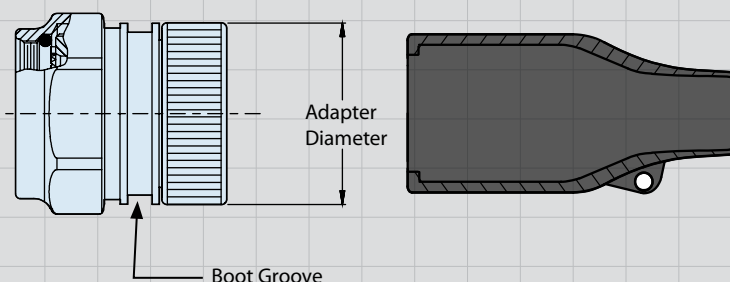


Table 1: Boot Size Selection Guide

Table 1: Boot Size Selection Guide						
Boot Size	Adapter Diameter				Min. Cable Diameter	
	Inches		Millimeters			
	Min	Max	Min	Max	In.	mm.
04	.600	1.000	15.24	25.40	.275	6.99
05	.750	1.200	19.05	30.48	.300	7.62
06	.900	1.350	22.86	34.29	.375	9.53
07	1.250	1.650	31.75	41.91	.425	10.80
08	1.400	2.250	35.56	57.15	.625	15.88
09	1.870	2.470	47.50	62.70	.660	16.80

Table 2: Material Attributes

Attribute	Type 1 High-Performance Semi-Rigid Elastomer
Continuous Operating Temp.	-75° to +150°C
Resistance to Fuels, Oils	Excellent
Low Toxicity, Zero Halogen	No

Table 3: Pre-Coated Boots Adhesive Information

Attribute	W1 High Temperature Hot Melt Adhesive	W2 Standard Hot Melt Adhesive	R High: Performance Epoxy Adhesive
Boot Material Compatibility	Types 1, 2 and 3	Types 1, 2 and 3	Type 1
Continuous Operating Temp.	-55° to +125°C	-40° to +80°C	-75° to +150°C
Resistance to Fuels, Oils, and Fluids	Good	Good	Excellent
Low Toxicity, Zero Halogen	Yes	Yes	Yes

Table 4: StarShield™
Shell Sizes and Boot Part
Numbers

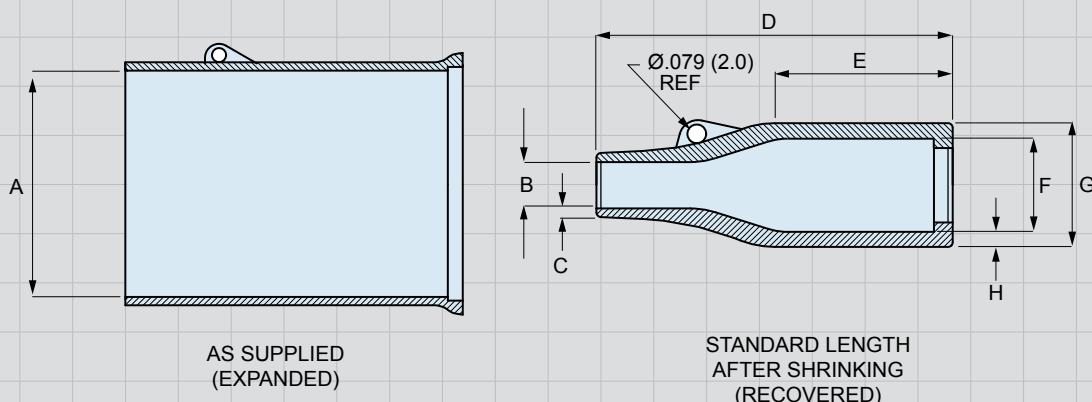
Shell Size	Shrink Boot Part Number
09	770-001S1 04
11	770-001S1 06
13	770-001S1 06
15	770-001S1 07
17	770-001S1 07
19	770-001S1 08
21	770-001S1 08
23	770-001S1 08
25	770-001S1 09

Dimensions in inches (millimeters) and are subject to change without notice.



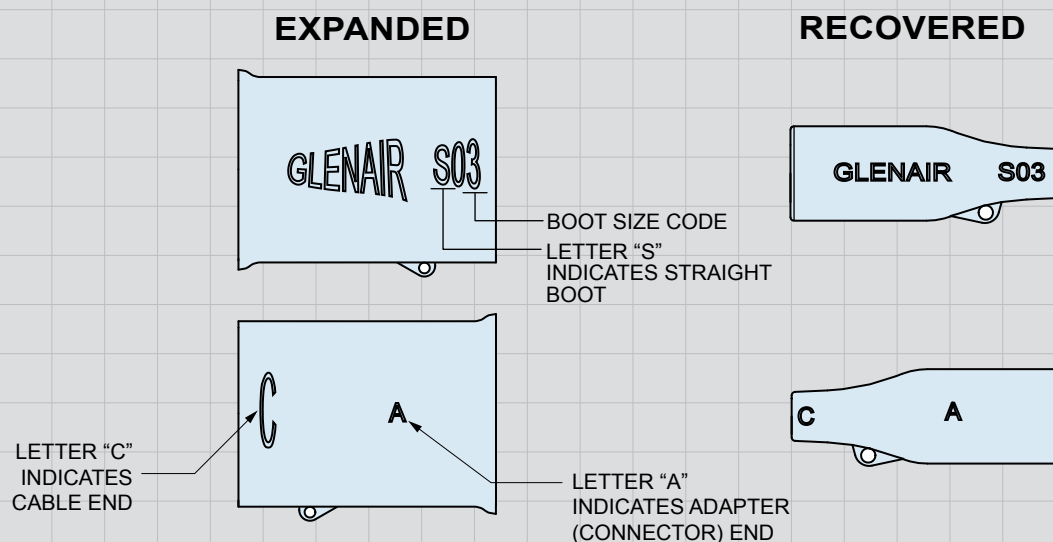
Series 77 Shrink Boots Lipped Straight Adapter Shrink Boots, Standard Dimensions

Lipped Straight Adapter Shrink Boots, Standard: Dimensions



Boot Size	A Min.		B Max.		C $\pm 20\%$		D $\pm 10\%$		E Ref.		F Max.		G Ref.		H $\pm 30\%$	
	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.
04	1.181	30.0	.236	6.0	.039	1.0	2.165	55.0	1.181	30.0	.551	14.0	.693	17.6	.071	1.8
05	1.260	32.0	.276	7.0	.047	1.2	2.638	67.0	1.299	33.0	.709	18.0	.850	21.6	.071	1.8
06	1.417	36.0	.335	8.5	.047	1.2	3.150	80.0	1.575	40.0	.866	22.0	.945	24.0	.079	2.0
07	1.693	43.0	.394	10.0	.051	1.3	3.898	99.0	2.165	55.0	1.102	28.0	1.276	32.4	.087	2.2
08	2.362	60.0	.591	15.0	.063	1.6	5.118	130.0	1.969	50.0	1.378	35.0	1.638	41.6	.130	3.3
09	2.599	66.0	.661	16.8	.079	2.0	6.693	170.0	3.543	90.0	1.750	44.5	2.050	52.0	.150	3.8

Lipped Straight Shrink Boots: Part Marking, Raised Lettering



Dimensions in inches (millimeters) and are subject to change without notice.

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770-001S1 Type 1 High-Performance Elastomer Straight Lipped Adapter Shrink Boots, Standard



Type 1 High-Performance Elastomer Boots for Advanced Temperature and Chemical Tolerance



Semi-rigid high performance boots combine excellent resistance to fuels, oils and solvents with superior performance at extreme temperatures. Rated for 3000 hours continuous operation at +150° C, these boots fit most standard boot adapters for circular connectors. Material meets the requirements of VG95343 Type 6, BSG 198-5-DE, EN62329-102 and SAE AS5258 Type H. These boots are recommended for demanding applications such as military vehicles and petrochemical exploration. Boots come standard in black, see table below for optional colors.

- -75° C to +150° C
- Excellent resistance to fuels, oils, solvents and heat.
- Ten available colors

Boot Size	Part Number with Eyelet	Part Number without Eyelet
	No Adhesive Lining	No Adhesive Lining
04	770-001S104	770-003S104
06	770-001S106	770-003S106
07	770-001S107	770-003S107
08	770-001S108	770-003S108
09	770-001S109	770-003S109

Add "-DH" to the end of any part number for drain holes.
Add "-PP" to the end of any part number for potting ports.

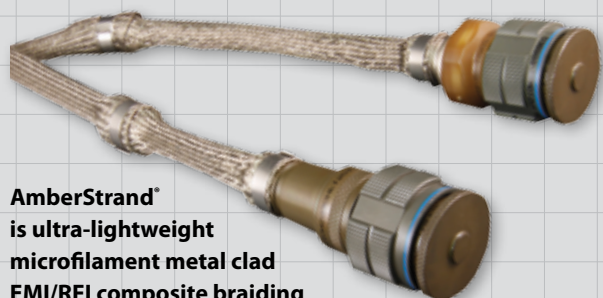
Material Color Options for Type 1 High Performance Elastomer Only Add Optional Color Mod Code to End of Any Type 1 Material Product

Mod Code	Color	Similar to (Reference)	Mod Code	Color	Similar to (Reference)
632 B	Blue	PANTONE 3005U	632 R	Red	PANTONE 1797U
632 E	Grey	FED-STD-595; #36270	632 T	Tan	FED-STD-595; #33446
632 G	Green	PANTONE 355U	632 W	White	FED-STD-595; #37875
632 P	Purple	FED-STD-595; #37100	632 Y	Yellow	PANTONE YELLOW U
632 O	Orange	FED-STD-595; #32300	Standard	Black	FED-STD-595; #37038



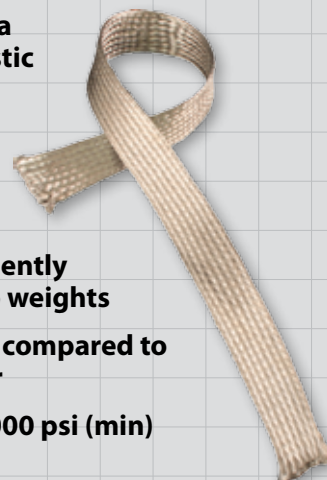
AmberStrand® Lightweight Composite Metal-Clad EMI/RFI Braided Shielding

AmberStrand®

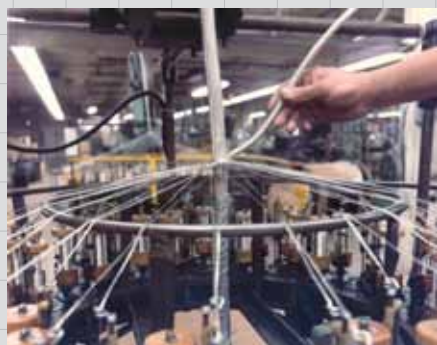


AmberStrand®
is ultra-lightweight
microfilament metal clad
EMI/RFI composite braiding

- Metal-clad EMI/RFI Shielding with a lightweight composite thermoplastic base material
- Highly conductive surface plating
- Reduce shielding weight up to 80% and more
- Reduce operation costs by permanently reducing launch and aircraft all-up weights
- Superior high frequency shielding compared to tinned and/or nickel plated copper
- Exceptional tensile strength: 590,000 psi (min)



**AmberStrand®: The smart way to reduce launch
and flight weights in aerospace systems**



Glenair can also offer AmberStrand® users direct factory overbraiding services for both point-to-point as well as multi-branch interconnect assemblies.

Composite strain-relief backshell with integrated AmberStrand® lightweight composite metal-clad braid shield sock.



100%
AmberStrand®

103 - 026 - 024

Diameter Dash
Number

75%/25%
AmberStrand® Blend

103 - 027 - 024

Diameter Dash
Number

How does Amberstrand® compare, in terms of mechanical performance, to other materials?

Material Type	AmberStrand® Thermoplastic	PEEK (Monofil)	Teflon (Yarn)	Kevlar (Yarn)	Dacron (Yarn)	Halar (Monofil)	Teflon FEP (Monofil)	Nomex (Yarn)	Polyester Type FR (Monofil)	Ryton Type R-7 (Monofil)	PTFE-Glass (Yarn)
Glenair P/N	103-026 103-027	102-051	102-061	102-071	102-073	102-023	102-060	103-013	102-001 102-002	102-080	100-022
Temperature Range	-65°C to +200°C	-65°C to +260°C	-55°C to +200°C	-73°C to +175°C	-62°C to +150°C	-65°C to +200°C	-55°C to +260°C	-55°C to +125°C	-55°C to +200°C	-65°C to +200°C	-75°C to +525°C
Tensile Strength (PSI) Yield	590,000	780,000	40,000	400,000	160,000	35,000	14,000	90,000	50,000	19,000	450,000
Elongation Percentage	2.5%	38%	19%	3.6%	12%	15%	50%	25%	20%	35%	5%
Chemical Resistance	Excellent	Excellent	Excellent	Excellent	Good	Excellent	Excellent	Excellent	Good	Excellent	Excellent
Abrasion Resistance	Good	Excellent	Good	Good	Excellent	Excellent	Good	Good	Good	Excellent	Excellent
Specific Gravity	1.45	1.30	2.10	1.44	1.38	1.68	2.17	1.58	1.38	1.25	2.50
Flammability	Will Not Burn	Very Low	Will Not Burn	Will Not Melt	Flammable	Flammable	Very Low	Will Not Melt	Very Low	Very Low	Will Not Burn

Dimensions in inches (millimeters) and are subject to change without notice.

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AmberStrand® Lightweight Composite Metal-Clad EMI/RFI Braided Shielding



Supplemental
Product Information

Aircraft Utilization Analysis

Comparison of AmberStrand® Composite EMI/RFI braid to 36 AWG A-A-59569 Ni/Cu Braid results in 60+ pounds weight savings in a typical commercial carrier

Where is all the EMI/RFI braid deployed in a typical commercial aircraft?

Diameter (in)	L Wing	R Wing	Fwd Belly	Aft Belly	HYD Bay	Aft Barrel	Tail	V/H Stab	Totals (in)
0 - 0.25	1852.2	1852.2	0	2811.4	168.2	2015.2	2480.6	1385	12564.8
0.25 - 0.5	434.8	434.8	511.6	1034.6	257.4	506.2	958.2	1121.7	5259.3
0.5 - 0.75	0	0	260.9	223	0	184.2	392.4	152.1	1212.6
0.75 - 1.0	0	0	77.2	0	0	1198	162.2	0	1437.4
1.0 - 1.5	0	0	0	0	0	446	21	0	467

How much would all this braid weigh if it was made of
36 AWG A-A-59569 NiCu?

Diameter (in)	Weight (Lb/ft)	Length (in)	Weight (Lb)
0 - 0.25	0.02	12564.8	21.08
0.25 - 0.5	0.05	5259.3	21.17
0.5 - 0.75	0.07	1212.6	7.12
0.75 - 1.0	0.14	1437.4	16.88
1.0 - 1.5	0.18	467	7.05
		Total weight	73.30 lbs

How much would all this braid weigh if it was made of
lightweight composite AmberStrand®?

Diameter (in)	Weight (Lb/ft)	Length (in)	Weight (Lb)
0 - 0.25	0.003	12564.8	4.16
0.25 - 0.5	0.008	5259.3	3.58
0.5 - 0.75	0.011	1212.6	1.16
0.75 - 1.0	0.018	1437.4	2.11
1.0 - 1.5	0.034	467	1.30
		Total weight	12.31 lbs

Expressed in percentages, how does 100% and 75% metal clad AmberStrand® compare against tin-coated copper?

Braid Diameter	AmberStrand® 100% 103-026	Tinned Copper 100-001	% Weight Savings/Foot	AmberStrand® 75/25 NiCu% 103-027	Tinned Copper 100-001	% Weight Savings/Foot
.062	.6	1.9	68%	.9	1.9	52%
.125	1.0	4.8	79%	1.5	4.8	68%
.250	1.8	16.1	88%	2.4	16.1	85%
.375	2.3	18.5	87%	3.9	18.5	79%
.500	3.7	22.3	83%	5.4	22.3	76%
.625	4.4	27.7	84%	6.4	27.7	77%
.750	5.2	34.3	85%	7.2	34.3	79%
1.000	8.0	35.0	77%	11.0	35.0	69%

103-031 AmberStrand® Lightweight Metal-Clad Spooled Fiber



Product Series

103 - 031

1

Plating

N = Nickel Plating

S = Silver Plating

N

Dash No.
(Table I)

Table I

Part Number	Spool Specification
103-031-1	Single End Spooled 3000 FT. Per Spool
103-031-2	Double End Spooled 1250 FT. Per Spool
103-031-3	Three End Spooled 833 FT. Per Spool
103-031-4	Four End Spooled 625 FT. Per Spool
103-031-5	Double End Spooled 500 FT. Per Spool
103-031-6	Six End Spooled 400 FT. Per Spool

D

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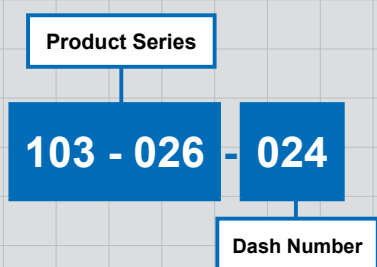


AmberStrand® Lightweight Composite Metal-Clad EMI/RFI Braided Shielding

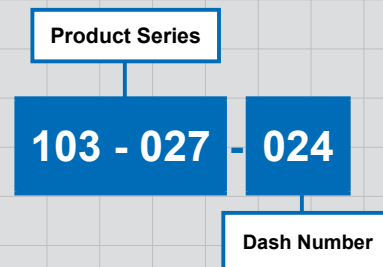
AmberStrand®

**103-026 and -027 AmberStrand® EMI/RFI Microfilament
Composite Braided Shielding 100% Composite and
75%/25% Blended Versions**

EMI/RFI Braid: How-To-Order



100% AmberStrand®



75%/25% AmberStrand®/Nickel Copper

103-026 100% Composite AmberStrand®			
Part No.	Inner Diameter	Ref. Wire Bundle Range	Approximate Grams Per Foot
103-026-004	.125 (3.2)	.093 (2.4)	1.0
		.140 (3.5)	
103-026-008	.250 (6.4)	.125 (3.2)	1.8
		.312 (7.9)	
103-026-012	.375 (9.5)	.325 (8.2)	2.3
		.437 (11.1)	
103-026-016	.500 (12.7)	.375 (9.5)	3.7
		.560 (14.2)	
103-026-020	.625 (15.9)	.375 (9.5)	4.4
		.700 (17.8)	
103-026-024	.750 (19.1)	.500 (12.7)	5.2
		.830 (21.1)	
103-026-032	1.000 (25.4)	.780 (19.8)	8.0
		1.100 (27.94)	
103-026-040	1.250 (31.8)	.938 (23.8)	10.0
		1.312 (33.3)	
103-026-048	1.500 (38.1)	1.187 (30.1)	15.2
		1.590 (40.37)	
103-026-064	2.000 (50.8)	1.312 (33.3)	22.0
		2.090 (53.08)	

103-027 75%/25% Blended Composite AmberStrand®/Nickel Copper			
Part No.	Inner Diameter	Ref. Wire Bundle Range	Approximate Grams Per Foot
103-027-004	.125 (3.2)	.093 (2.4)	1.5
		.140 (3.5)	
103-027-008	.250 (6.4)	.125 (3.2)	2.4
		.312 (7.9)	
103-027-012	.375 (9.5)	.250 (6.4)	3.9
		.437 (11.1)	
103-027-016	.500 (12.7)	.375 (9.5)	6.0
		.550 (13.9)	
103-027-020	.625 (15.9)	.375 (9.5)	6.4
		.700 (17.8)	
103-027-024	.750 (19.1)	.500 (12.7)	7.2
		.830 (21.1)	
103-027-032	1.000 (25.4)	.780 (19.8)	11.0
		1.100 (27.94)	
103-027-040	1.250 (31.8)	.938 (23.8)	15.0
		1.312 (33.3)	
103-027-048	1.500 (38.1)	1.187 (30.1)	25.2
		1.590 (40.37)	
103-027-064	2.000 (50.8)	1.312 (33.3)	32.0
		2.090 (53.08)	

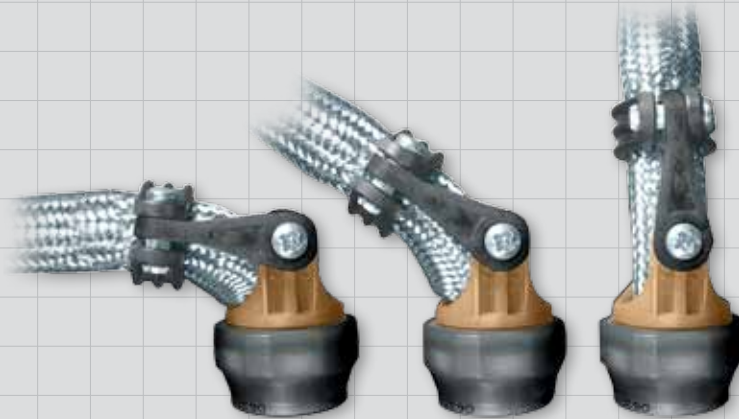
Specify length on purchase order. No minimums!
Additional sizes and configurations- consult factory

ArmorLite™ Microfilament Nickel Clad Stainless Steel EMI/RFI Braided Shielding



Supplemental
Product Information

ARMORLITE™



- Ultra-lightweight EMI/RFI braiding for high-temperature applications -80°C to +260°C
- Microfilament stainless steel: 70% lighter than NiCu A-A-59569
- Outstanding EMI/RFI shielding and conductivity
- Reduce shielding weight up to 70% and more
- Superior flexibility and "windowing" resistance:
90 to 95% optical coverage
- 220,000 psi (min) tensile strength
- Best performing metallic braid during lightning tests (Run to ANSI/EIA-364-75-1997 Waveform 5B)

Save weight and money every time you fly! Aircraft All-Up-Weight (AUW) has met its match: ArmorLite™ microfilament stainless steel braid saves pounds compared to standard QQ-B-575/A-A-59569 EMI/RFI shielding.



Choose user-installable microfilament tubular braid in twelve standard diameters Assemble per standard multi-branch cable shielding processes, as above.



Glenair can also offer ArmorLite™ users direct factory overbraiding services for both point-to-point as well as multi-branch assemblies.

100%
ArmorLite™

103 - 051 - 024

Diameter Dash
Number



A single layer of ArmorLite™ Shields from 40dB to 80dB in Frequency Ranges from 30kHz to 2.5GHz



ArmorLite™ Microfilament Nickel Clad Stainless Steel EMI/RFI Braided Shielding

Aircraft Utilization Analysis

Comparison of ArmorLite™ nickel clad stainless steel braid to A-A-59569 Ni/Cu braid

Where is all the EMI/RFI braid deployed in a typical commercial aircraft?

Diameter (in)	L Wing	R Wing	Fwd Belly	Aft Belly	HYD Bay	Aft Barrel	Tail	V/H Stab	Totals (in)
0 - 0.25	1852.2	1852.2	0	2811.4	168.2	2015.2	2480.6	1385	12564.8
0.25 - 0.5	434.8	434.8	511.6	1034.6	257.4	506.2	958.2	1121.7	5259.3
0.5 - 0.75	0	0	260.9	223	0	184.2	392.4	152.1	1212.6
0.75 - 1.0	0	0	77.2	0	0	1198	162.2	0	1437.4
1.0 - 1.5	0	0	0	0	0	446	21	0	467

How much would all this braid weigh if it was made of
36 AWG A-A-59569 Ni/Cu?

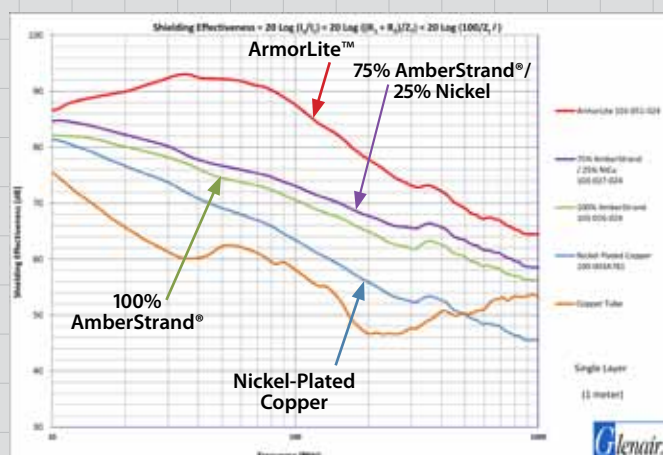
Diameter (in)	Weight (Lb/ft)	Length (in)	Weight (Lb)
0 - 0.25	0.02	12564.8	21.08
0.25 - 0.5	0.05	5259.3	21.17
0.5 - 0.75	0.07	1212.6	7.12
0.75 - 1.0	0.14	1437.4	16.88
1.0 - 1.5	0.18	467	7.05
		Total weight	73.30 Lbs

How much would all this braid weigh if it was made of
ArmorLite™ Micro Stainless Steel Braided Shielding?

Diameter (in)	Weight (Lb/ft)	Length (in)	Weight (Lb)
0 - 0.25	.00507	12564.8	5.309
0.25 - 0.5	.0097	5259.3	4.251
0.5 - 0.75	.0178	1212.6	1.737
0.75 - 1.0	.0256	1437.4	3.063
1.0 - 1.5	.0368	467	1.434
		Total weight	15.794 Lbs

Shielding Effectiveness

For EMI/RFI Braiding Solutions - 0 MHz to 2500 MHz Range



Surface Transfer Impedance

For EMI/RFI Braiding Solutions - 0 MHz to 2500 MHz Range



Dimensions in inches (millimeters) and are subject to change without notice.

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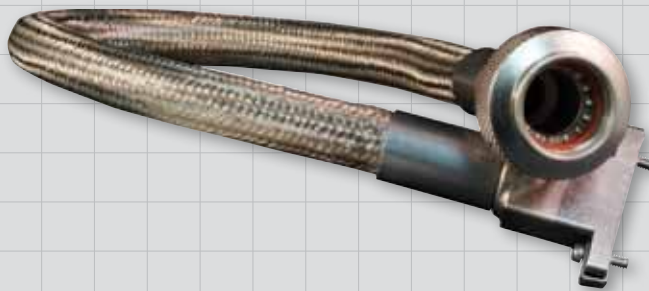
ArmorLite™ Microfilament Nickel Clad Stainless Steel EMI/RFI Braided Shielding



Supplemental
Product Information



EMI/RFI Braid: How-To-Order



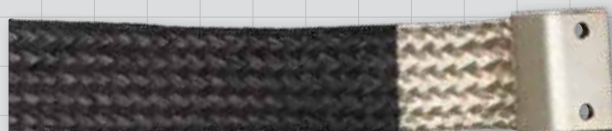
Product Series

103 - 051 - 024

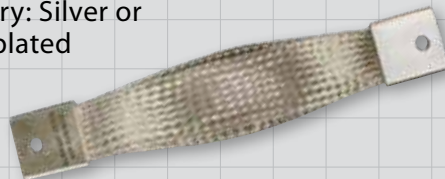
Dash No.
(Table I)

Specify length on purchase order. No minimums!
Additional sizes and configurations- consult factory

Glenair 107 series ground straps with ArmorLite.



The lightest ground straps
in the industry: Silver or
nickel plated



103-051 ArmorLite™ Lightweight EMI/RFI Microfilament Stainless Steel Braided Shielding

- Thermal Cycling: No Adverse Effects
- Flame: Self Extinguishing
- Flex Test: 50,000 Cycles
- Salt Spray: 500 Hours
- 70+% Lighter than NiCu QQ-B-575/A-A-59569
- Enhanced EMI/RFI Electrical Performance (DC resistance 1 Ohm/ft).

Table I

Part Number	Inner Diameter	Ref. Wire Bundle Range	Approximate Grams Per Foot
103-051-001	.031 (0.8)	.016 (0.4)	.5
		.047 (1.2)	
103-051-002	.062 (1.6)	.040 (1.0)	1.15
		.075 (1.9)	
103-051-004	.125 (3.2)	.093 (2.4)	1.5
		.140 (3.5)	
103-051-008	.250 (6.4)	.125 (3.2)	2.2
		.312 (7.9)	
103-051-012	.375 (9.5)	.250 (6.4)	2.9
		.406 (10.3)	
103-051-016	.500 (12.7)	.375 (9.5)	4.4
		.560 (14.2)	
103-051-020	.625 (15.9)	.375 (9.5)	4.8
		.700 (17.8)	
103-051-024	.750 (19.1)	.500 (12.7)	5.8
		.800 (20.3)	
103-051-032	1.000 (25.4)	.780 (19.8)	11.5
		1.100 (27.9)	
103-051-040	1.250 (31.8)	.938 (23.8)	14.0
		1.312 (33.3)	
103-051-048	1.500 (38.1)	1.187 (30.1)	17.3
		1.590 (40.4)	
103-051-064	2.000 (50.8)	1.312 (33.3)	22.8
		2.090 (53.1)	

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D

Finishes

**Electroless Nickel**

Cost	\$ \$ \$ \$ \$ \$
Conductivity	++ ++ ++ ++ ++
Corrosion Resistance	⌘ ⌘ ⌘ ⌘ ⌘
Operating Temperature	-65 to +200°C
Glenair Code	M

Aluminum plated with electroless nickel offers excellent conductivity, wear resistance, and adequate corrosion resistance. Typically specified on electrical connectors and accessories used in avionics boxes, exoatmospheric equipment, and missiles, electroless nickel is a good choice when exposure to marine or corrosive atmospheres is not a primary concern. The plating process is purely chemical, and once started, is autocatalytic (it runs by itself).

**Stainless Steel**

Cost	\$ \$ \$ \$ \$ \$
Conductivity	++ ++ ++ ++ ++
Corrosion Resistance	⌘ ⌘ ⌘ ⌘ ⌘
Operating Temperature	-65 to +200°C
Glenair Code	Z1, ZM

Stainless steel offers unbeatable strength and protection from environmental stress if durability and corrosion resistance are more important than cost and weight. Typically found on aircraft engines, landing gear, geophysical equipment, armored vehicles and marine applications, passivated stainless steel is widely specified throughout the interconnect industry. Also offered with nickel and cadmium plating for improved conductivity, stainless steel is an obvious alternative to cadmium if cost and weight are not an issue.

**Zinc Nickel, Black**

Cost	\$ \$ \$ \$ \$
Conductivity	++ ++ ++ ++ ++
Corrosion Resistance	⌘ ⌘ ⌘ ⌘ ⌘
Operating Temperature	-65 to +175°C
Glenair Code	ZR

RoHS-compliant black zinc-nickel is approved for MIL-DTL-38999, AS85049 and other major military specifications as a replacement for cadmium and hexavalent chromium platings. The non-reflective finish and good conductivity make the Glenair ZR finish a leading choice for cadmium-free tactical systems. Corrosion resistance is comparable to cadmium, and the ZR finish is backward-compatible with cad-plated connectors and accessories.

**Nickel-PTFE**

Cost	\$ \$ \$ \$ \$ \$
Conductivity	++ ++ ++ ++ ++
Corrosion Resistance	⌘ ⌘ ⌘ ⌘ ⌘
Operating Temperature	-65 to +175°C
Glenair Code	MT

Now approved for MIL-DTL-38999 and MIL-DTL-83513, Glenair's 1000 Hour Grey™ meets the need for a cadmium replacement with excellent conductivity, wear resistance and corrosion protection. This extremely durable finish is gun-metal gray. A proprietary preliminary undercoat is followed with a composite coating of electroless nickel phosphorus and polytetra-fluoroethylene (PTFE). An organic topcoat provides sealing and added resistance to SO₂ salt fog. Ni-PTFE is approved for the Joint Strike Fighter and offers extremely good lubricity.

**Cadmium Olive Drab**

Cost	\$ \$ \$ \$ \$ \$
Conductivity	++ ++ ++ ++ ++
Corrosion Resistance	⌘ ⌘ ⌘ ⌘ ⌘
Operating Temperature	-65 to +175°C
Glenair Code	NF

Cadmium plated aluminum has been the unchallenged workhorse of the defense/aerospace industry. Offering up to 1000 hours of salt spray protection when deposited over electroless nickel, cadmium is highly conductive, and provides good lubricity and resistance to galling. As plated, cadmium has a silvery appearance. A subsequent chromic acid passivation bath creates a chromate topcoat over the cadmium, enhancing corrosion protection. Olive drab chromate is widely used, followed by gold chromate and clear chromate.

**Zinc-Nickel Olive Drab**

Cost	\$ \$ \$ \$ \$
Conductivity	++ ++ ++ ++ ++
Corrosion Resistance	⌘ ⌘ ⌘ ⌘ ⌘
Operating Temperature	-65 to +175°C
Glenair Code	ZN

Recently added to MIL-DTL-38999 and MIL-DTL-83513, zinc-nickel plated aluminum has become a cost-effective alternative to cadmium. Available with olive drab or black chromate conversion coatings, zinc-nickel plated aluminum is commonly found on soldier systems and military airframe applications.

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About Composite Materials



- High temperature, high strength engineering composite thermoplastics for maximum strength and durability
- Total immunity to galvanic corrosion
- Up to 70% weight reduction compared to standard metal connectors and accessories
- Hundreds of innovative, tooled designs
- All popular part numbers in stock and ready for immediate, same-day shipment

Corrosion resistance, weight reduction, durability and design innovation

Glenair composite interconnect components are principally manufactured from 30% glass fiber polyetherimide (PEI), an amorphous thermoplastic with outstanding heat and chemical resistance and high strength. At room temperature the 30% glass filled PEI exhibits strength far beyond that of most engineering thermoplastics, with a tensile strength yield of over 15,000 psi. The PEI material meets all outgassing and flammability requirements.



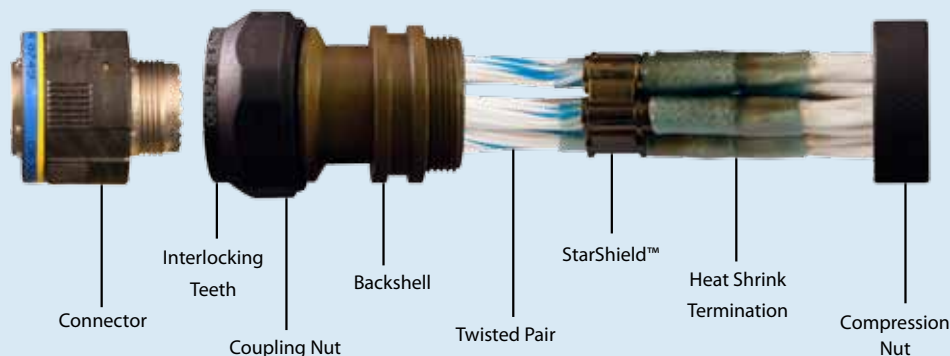
Composite Thermoplastic Vs. Common Metal Materials

Material	Specific Gravity	Density (lbs. Inch ³)	Salt Spray
Composite	1.27 - 1.51	.055	2000+ Hrs
Aluminum	2.55 - 2.80	.098	48-1000 Hrs
Titanium	4.51 - 4.62	.162	500-1000 Hrs
Stainless Steel	7.70 - 7.73	.284	500-1000 Hrs
Brass	8.40 - 8.70	.305	500-1000 Hrs

Standard Finishes

Sym	Material	Finish
XO	Composite Thermoplastic	No Plating, Natural
XB		No Plating, Black
XZR		Conductive, Zinc Nickel, Black
XM		Conductive, Electroless Nickel
XMT		Conductive, Ni-PTFE 1000 Hour Grey™
XW		Conductive, Cadmium O.D. Over Electroless Nickel

Ultra-Lightweight Composite Thermoplastic StarShield™ Termination

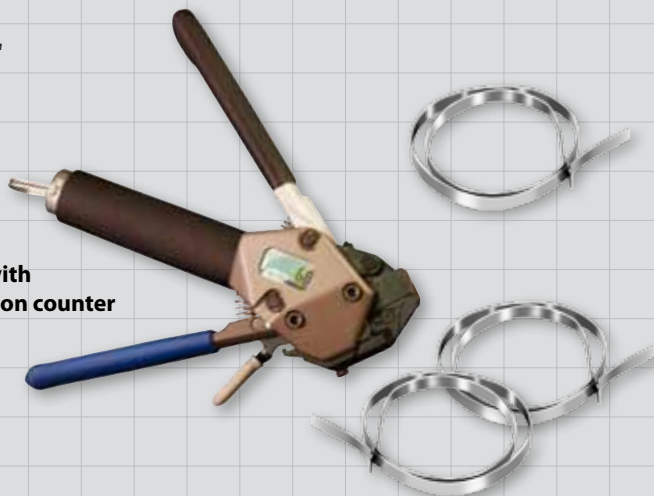




Back Shell Assembly Tools Band-Master™ ATS EMI/RFI Shield Termination Equipment

New Band-Master™
ATS Hand Banding
Tool

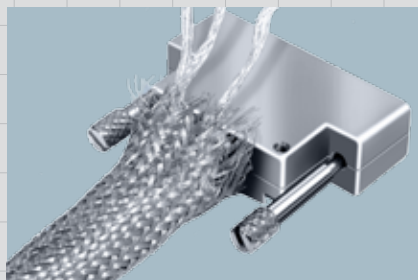
Now available with
built-in calibration counter



- Fast, cost-effective cable shielding termination
- Precision hand-held tool and bands deliver reliable, repeatable performance
- Single piece stainless steel bands in various sizes and lengths
- Clamp both small and large diameters easily and reliably
- Pneumatic banding tool for high-speed mass production
- Qualified for both military and commercial aviation

The Band-Master™ ATS provides quick, easy, cost-effective and highly reliable termination of braided metallic shielding or fabric braid to connectors and backshells.

The unique low profile and smooth inside diameter of the one-piece type 304 austenitic stainless steel clamping band virtually eliminates RFI/EMI/EMP leakage paths. The lock maintains constant tension under extreme environmental conditions. *Band-Master™ ATS* bands have passed severe shock, vibration and thermal cycle testing with negligible deterioration of shell conductivity.



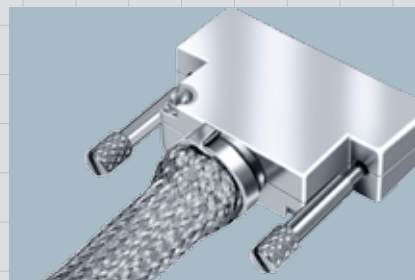
Step One: Cable Prep

Lay individual shields over the band platform. Pull overall braid shield over the band platform so that all braid strands will be captured by the band.



Step Two: Install Band

Wrap the band through the buckle twice. Insert the free end into the banding tool in the direction shown on the tool. Squeeze the short grey handle to insert the band. Slide the band onto the cable. Close the black handle repeatedly until the handle no longer opens. Close the long grey handle until the tool cuts the band. Remove the excess band from the tool by closing the small grey handle.



Step Three: Trim Braid

It's a snap! Just trim the excess braid and you're done.



**Series 687-749
banding split
support rings for
use with shield sock
band termination**

Dimensions in inches (millimeters) and are subject to change without notice.

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Back Shell Assembly Tools Band-Master™ ATS EMI/RFI Shield Termination Equipment



Supplemental
Product Information

Band-Master™ ATS Advanced Termination System



Series 601-104 (standard)
and 601-105 (micro)
bench-mountable
pneumatic banding tool

Save time and tool maintenance costs
with the Glenair Band-Master™ ATS
calibration system



Band-Master™ ATS Band Selection								
Bands	Length		Part Number				Accommodates Diameter	
	in.	mm.	Flat	Pre-Coiled	100 Count Flat	100 Count Precoiled	in.	mm.
Short Standard Band	9.0	228.6	601-005	601-006	601-007	601-008	1.0	25.4
Medium Standard Band	14.25	362.1	601-040	601-041	601-042	601-043	1.8	45.7
Long Standard Band	18.0	457.2	601-049	601-050	601-051	601-052	2.5	63.5
Short Micro Band	5.0	127.0	601-024	601-025	601-026	601-027	0.5	12.7
Medium Micro Band	8.125	206.4	601-060	601-061	601-062	601-063	.88	22.4
Long Micro Band	14.25	362.0	601-064	601-065	601-066	601-067	1.88	47.8

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Backshell-to-Connector Assembly Tools



Glenair offers a complete family of backshell assembly tools for most Mil-Standard circular connectors, as well as connector wrenches, strap wrenches, and universal connector holding tools

- Backshell-to-connector holding tools for all cylindrical connectors and accessories in current use
- Special composite thermoplastic coupling nut holding tools
- Discrete tools and complete sets available
- Popular Glenair strap wrenches
- Hand-held and bench-mountable digital torque wrenches
- Cutting shears and other special-purpose cable assembly tools

Torque Values for Cable Clamp Screws

Torque Requirements in Inch-Pounds
for Corrosion-Resistant Steel Screws Only*

Screw Size	Recommended Torque
2-56	2+.5
4-40	4+.5
6-32	6+1.0
8-32	8+1.0
10-32	10+1.0
.250-20	12+1.0

Glenair Offers a Complete Family of Backshell Assembly Tools

Connector Holding Wrenches for Most Military Standard Circular Connectors

TG47 • MIL-DTL-22992

TG48 • MIL-DTL-38999 Series II

TG52 • MIL-DTL-81511 Series II and IV

TG60 • MIL-DTL-27599 and MIL-DTL-38999 Series I

TG61 • MIL-DTL-81511 Series I and II

TG83 • (LN29729) for SJT Connectors

TG90 • MIL-DTL-38999 Series III



TG69
Soft Jaw Pliers

Glenair TG70 Strap Wrench with Square Drive for Torque Wrench

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Backshell-to-Connector Assembly Tools



Supplemental
Product Information

Installation Torque Values for Circular Electrical Connector Accessories

Accessory Thread Torque: ± 5 inch pounds

Shell Sizes	Group 1	Group 2	Group 2
	Light & Medium MIL-C-5015 (MS3100 Series) MIL-C-26482 Series I MIL-C-26500 MIL-C-27599 MIL-C-38999 Series I, II MIL-C-81511 Series I, II, III, IV MIL-C-81703 Series I	Duty Heavy Duty MIL-C-5015 (MS3400 Series) MIL-C-22992 MIL-C-26482 Series II MIL-C-28840 MIL-C-38999 Series III, IV MIL-C-81703 Series III MIL-C-83723 Series I, II, III	Values for Hand Held Tool Applications Field Repair Torque
8, 9, A	35	56	40-50
3, 10, 10SL, 11, B	35	76	40-50
7, 12, 12S, 13, C	40	108	40-50
14, 14S, 15, D	40	116	50-60
16, 16S, 17, E	40	116	50-60
18, 19, 27, F	40	116	50-60
20, 21, 37, G	80	136	80-90
22, 23, H	80	136	80-90
24, 25, 61, J	80	136	80-90
28, 29	120	148	120-130
32, 33	120	148	120-130
36	120	148	120-130
40	160	164	150-170
44	160	164	150-170
48	160	164	150-170

Torque Wrenches and Bench Stands



Hand-Held Torque Wrench
600-076 High Torque
600-004 Standard Torque

Digital Torque Wrench
600-161

Bench Stand
600-162
For Digital Torque Wrench
600-161

Vertical and Horizontal
Mounting Options



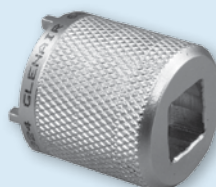
Backshell Coupling Nut Wrenches



600-006 Standard
600-079 Anti-Decoupling
600-102 Standard (Stainless Steel)
Circular Backshell Composite
Assembly Wrenches



600-091 Composite-Hex-Coupling
Wrench for Backshells



Spanner Tool for
Tightening Series 80
Jam Nuts

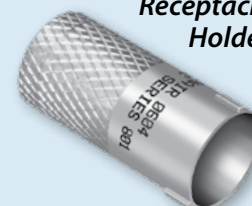
Backshell Assembly and Repair Tool Kits

The **TG80 Tool Kit** is designed
for field use with circular
electrical connectors. Tool Kits
conforming to the requirements
of **MIL-T-83507** are also available

Plug and Receptacle Holding Tools for Backshell-to- Connector Assembly



Plug
Holder



Receptacle
Holder

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*Outstanding
Customer Service!*



Abundant Machining Capacity!



In-House Assembly!



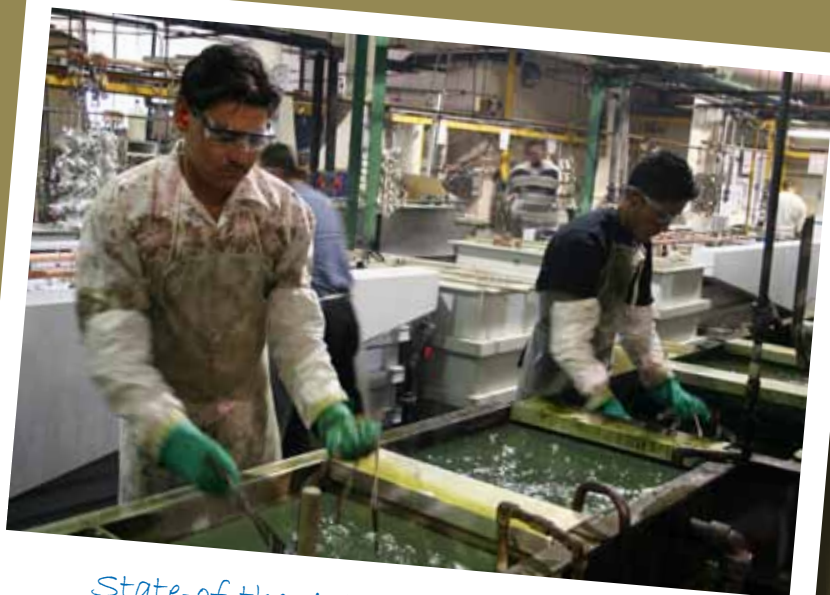
Huge "Same-Day" Inventory!



*One of North America's
and Machining*



High-Production Injection Molding Equipment



State-of-the-Art Plating Capabilities



The Industry's Most Experienced EMI/RFI Braided Shielding Specialists



Largest CNC Milling Installations



Clean Rooms for Filter Array and Printed Circuit Board Assembly



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SOLUTIONS**

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Glenair Italia S.p.A.

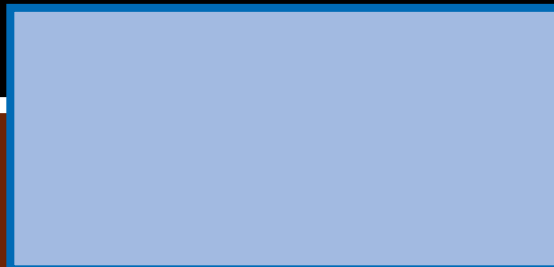
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